GENERAL MOTORS ENHANCED MOBILITY PACKAGE SERVICE MANUAL SUPPLEMENT

BLANK

Preface

Caution

Caution: To reduce the chance of personal injury and/or property damage, carefully observe the instructions that follow:

The service manuals of General Motors Corporation are intended for use by professional, qualified technicians. Attempting repairs or service without the appropriate training, tools, and equipment could cause injury to you or others. This could also damage the vehicle, or cause the vehicle to operate improperly.

Proper vehicle service and repair are important to the safety of the service technician and to the safe, reliable operation of all motor vehicles. If you need to replace a part, use the same part number or an equivalent part. Do not use a replacement part of lesser quality.

The service procedures we recommend and describe in this service manual are effective methods of performing service and repair. Some of the procedures require the use of tools that are designed for specific purposes.

Accordingly, any person who intends to use a replacement part, a service procedure, or a tool that is not recommended by General Motors, must first establish that there is no jeopardy to personal safety or to the safe operation of the vehicle.

This manual contains various "Cautions" and "Notices" that you must observe carefully to reduce the risk of personal injury during service or repair. Improper service or repair may damage the vehicle or render the vehicle unsafe. For Cautions and Notices, refer to Cautions and Notices in the C/K Truck Service Manual. These "Cautions" and "Notices" are not exhaustive. General Motors cannot possibly warn of all potentially hazardous consequences of your failure to follow these instructions.

This manual covers service procedures to vehicles that are equipped with a Supplemental Inflatable Restraint (SIR). Refer to the "Cautions" in Cautions and Notices and in Restraints. Refer to SIR component and wiring location views in Restraints before performing a service on or around SIR components or wiring. Failure to follow these "Cautions" could cause air bag deployment, personal injury, or otherwise unneeded SIR repairs.

In order to help avoid accidental air bag deployment and personal injury, whenever you service a vehicle that requires repair of the SIR and another vehicle system, we recommend that you first repair the SIR, then go on to the other system.

BLANK

Enhanced Mobility Package
Service Manual Supplement

This manual provides information on the diagnosis, the service procedures, the adjustments, and the specifications for the GM Enhanced Mobility Package Pickup.

Information on transmission unit repair (overhaul) can be found in the Transmission/Transaxle/Transfer Case Unit Repair Manual (TURM), available separately. The TURM contains information on automatic and manual transmissions and transaxles including the fluid flow and circuit description information.

The technicians who understand the material in this manual and in the appropriate Dealer Service Bulletins better service the vehicle owners.

When this manual refers to a brand name, a part number, or a specific tool, you may use an equivalent product in place of the recommended item. All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication approval. General Motors reserves the right to make changes at any time without notice.

Published by

GM DEFENSE MILITARY TRUCKS

General Motors Corporation

Detroit, Michigan 48265

©2003 GENERAL MOTORS CORPORATION ALL RIGHTS RESERVED

The information cutoff date is 07/01/04 LITHO IN U.S.A.

PART NO. EMPSM03

No part of this manual may be reproduced, stored in any retrieval system, or transmitted in any form or by any means (including but not limited to electronic, mechanical, photocopying, and recording) without the prior written permission of General Motors Corporation. This applies to all text, illustrations and tables.

Error and Suggestions Reporting

If you find an error with this GM service manual supplement, or if you have a suggestion about this GM service manual supplement, we want to hear from you.

When calling, be prepared with the following information:

- Your name
- Your dealership's name/Military organization
- Your dealership's/Military organization's phone number
- The model year and the vehicle line
- The publication part number (if present)
- The vehicle identification number of the vehicle being worked on
- The service manual section and page number(s)
- Any applicable electronic information element identification numbers
- A descriptive explanation of your concern

The GM service manual phone personnel will respond to your concerns in the following ways:

- By delivering your concern to the manual's author
- By eliciting a response from the author
- By supplying you with an answer to your concerns

For paper manual users: The GM service manual phone personnel will also explain how to send in examples or marked-up pages.

The GM service manual comment telephone numbers do not provide technical assistance. For technical assistance, contact your regular technical assistance source.

United States
Please call the following number Monday through Friday 8 a.m.– 8 p.m. eastern time with your comments:
1-800-828-6860 or fax to number 248-265-9327.

United States Owner/Operator
Vehicle owners or operators are encouraged to address their comments and concerns to the applicable Customer Assistance Center. The phone number and address of the Customer Assistance Center are in the Owner's Manual.

General Motors Defense

Contact Information

Refer to the web at www.gm.defense.com

Mailing Address:

GM Defense

Military Trucks

MC: 482-A19-A24

100 GM Renaissance Center

P. O. Box 100

Detroit, MI 48265-1000

SERVICE MANUAL SUPPLEMENT COMMENT FORM

Use this form to advise us of any errors you might find in this manual. We also welcome suggestions for improving this Service Manual Supplement.

Service Manual(s) that have the error _____

Page number(s) that have the error _____

Graphic number(s) that have the error _____

VIN (if available) or model and applicable options_____

Describe in detail, the error found or the suggestion(s). Attach additional pages if necessary.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

From: Organization Name _____ Dealer Code _____

City/Town_____ State_____

Name of Person Submitting This Comment Form _____

Signature _____ Date _____

Mail To: GM Defense

Mail Code: 482-A19-A24

100 GM Renaissance Center

P. O. Box 100

Detroit, MI 48265-1000

USA

Attention: ILS Manager Fleet and Commercial

BLANK

Table of Contents

Preface

General Information

General Information....0-3
Maintenance and Lubrication....0-7

Suspension

Front Suspension....3-3
Rear Suspension....3-11
Tires and Wheels....3-17
Tire Pressure Monitoring....3-30

Driveline/Axle

Front Drive Axle....4-3
Rear Drive Axle....4-5
Transfer Case....4-8

Engine

Engine Electrical....6-3
Engine Controls....6-5

Body and Accessories

Instrument Panel, Gages and Console....8-3
Bumpers....8-7
Body Front End....8-13
Interior Trim....8-19
Frame and Underbody....8-21

INDEX....INDEX-1

BLANK

Section 0

General Information

General Information.....0-3
Vehicle Identification 0-3
Equipment Options 0-4
Commercial Utility/Cargo Vehicle EMP Specifications/Options 0-4
Labels 0-5
Government Data Plate..... 0-5
Maintenance and Lubrication.....0-7
Maintenance 0-7
Owner Checks and Services..... 0-7
Periodic Maintenance Inspection 0-7

BLANK

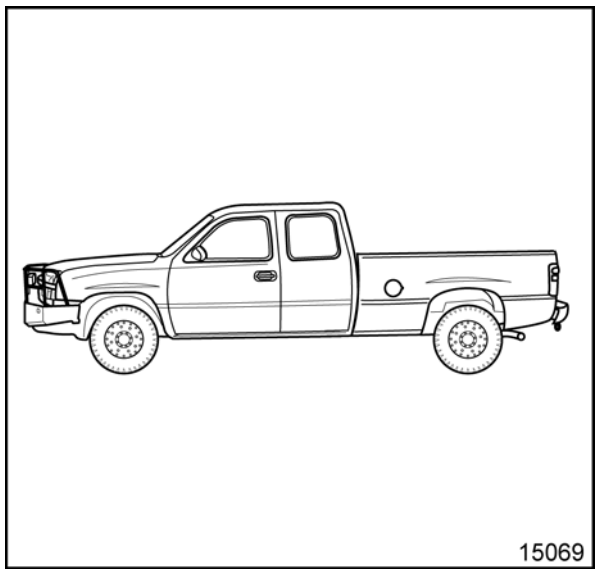
General Information

Vehicle Identification

The Enhanced Mobility Package series military pickup, models derive from standard commercial vehicles. The pickup is a 2500HD, or “1-ton” Silverado.

All vehicles have rugged designs intended for all types of roads or off-road travel. They can ford water obstacles for three minutes without stalling at depths of 51 cm (20 in) at 8 kph (5 mph). These limits are met without causing permanent damage or requiring immediate maintenance.

Enhanced Mobility Package Vehicle



The pickup vehicles are equipped with a 6.6L Turbo diesel engine with a 5-speed Allison automatic transmission and 2-speed transfer case.

Each vehicle is equipped with enhanced suspension, 4-wheel anti-lock brakes, a locking differential, on-off road beadlock tires and tire pressure monitoring system.

Equipment Options

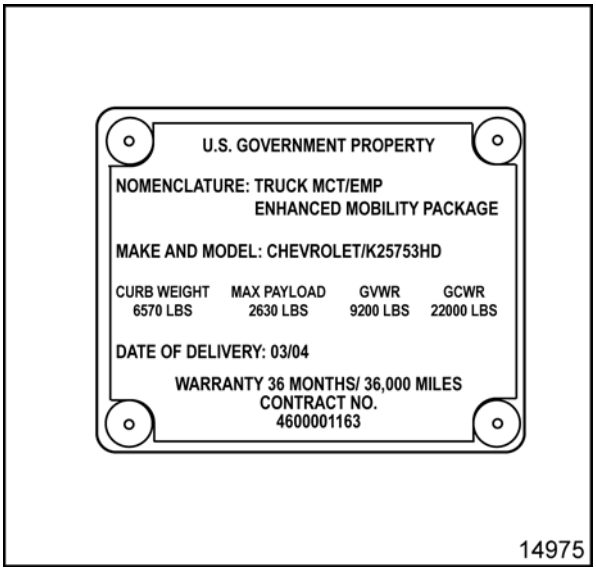
Commercial Utility/Cargo Vehicle EMP Specifications/Options

Your vehicle may be equipped with any combination of options.

Description
Trailer Light Connection
Heavy Duty Front and Rear Shocks
Transfer Case/Differential Vent Filter
Government Data Plate
Factory Rear Receiver Hitch
Enhanced Suspension
Heavy Duty Front Bumper with Brush Guard
Sliding Rear Window
Tire Pressure Monitoring System
Beadlock Tires
Interior Air Cleaner Restrictor Gage

Labels

Government Data Plate



The government data plate is located on the left front inner door panel. This label includes the contract No. and vehicle weight specifications.

BLANK

Maintenance and Lubrication

Maintenance

Owner Checks and Services

If the engine, controls, instruments or gages do not operate as described in this supplement manual, refer to one of the following manuals:

- C/K Truck Owner's Manual
- C/K Truck Service Manual
- Diesel Engine Owner's Manual Supplement

If the concern still has not been corrected, shut down the engine and notify your maintenance unit.

Periodic Maintenance Inspection

- Inspect the condition of the headlamps, tail lamps, turn signals and side lamps before beginning to operate the vehicle each time.
- Inspect the axle vent tube filter for blockages every six months and more often when difficult off-road conditions are encountered. Replace as needed.
  Refer to the Front or Rear Axle Vent Tube Filter Replacement procedure in Driveline/Axle.
- Inspect the transfer case vent tube filter for blockages every six months and more often when difficult off-road conditions are encountered. Replace as needed.
  Refer to Transfer Case Vent Tube Filter Replacement Procedure in Driveline/Axle.
- Refer to the Maintenance Schedule in the Owner's Manual for other items of maintenance.

BLANK

Section 3

Suspension

Front Suspension 3-3
Specifications 3-3
Repair Instructions 3-4
Shock Absorber Replacement 3-4
Lower Jounce Control Arm Replacement 3-6
Jounce Shock Absorber Replacement 3-8
Description and Operation 3-9
Front Enhanced Suspension 3-9
Front Shock Absorber Description 3-9
Front Hydraulic Jounce Bumper Description 3-9
Rear Suspension 3-11
Specifications 3-11
Repair Instructions 3-12
Shock Absorber Replacement 3-12
Shock Absorber Cover Replacement - Left 3-12
Shock Absorber Cover Replacement - Right 3-13
Rear Jounce Shock Absorber Mount Replacement 3-14
Rear Jounce Shock Absorber Replacement 3-15
Description and Operation 3-16
Rear Enhanced Suspension 3-16
Rear Shock Absorber Description 3-16
Rear Shock Absorber Cover Description 3-16
Rear Hydraulic Jounce Bumper 3-16
Tires and Wheels 3-17
Specifications 3-17
Component Locator 3-18
Repair Instructions 3-19
Tire Mounting and Dismounting Procedure 3-19
Spare Tire Replacement 3-26
Spare Tire Carrier Replacement 3-26
Jack Mounting Bracket Replacement 3-27
Description and Operation 3-28
Tires and Wheels 3-28
Special Tools and Equipment 3-29
Tire Pressure Monitoring 3-30
Specifications 3-30
Schematic and Routing Diagrams 3-31
Tire Pressure Monitoring System 3-31
Component Locator 3-33
Connector End Views 3-35
Diagnostic Information and Procedures 3-36
Error Code E1 3-36
Error Code E2 3-36
Error Code E3 3-36
Error Code E4 3-36
Repair Procedures 3-37
Receiver Replacement 3-37
Monitor Display Replacement 3-37
Pressure Transmitter Replacement 3-38
Tire Pressure Monitoring Programming 3-39
Description and Operation 3-50
General Description – Tire Pressure Monitoring 3-50
Special Tools and Equipment 3-51

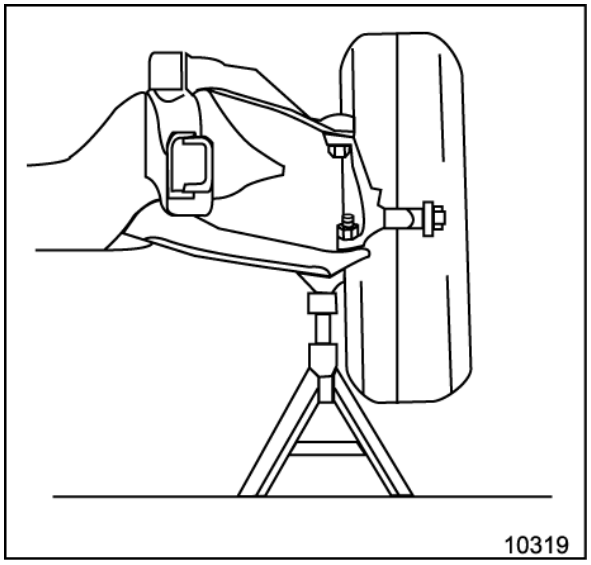
BLANK

Front Suspension

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Jounce Shock Lower Bolt	125 N•m	92 lb ft
Jounce Shock Upper Bolt	125 N•m	92 lb ft
Lower Jounce Control Arm Brace Bolt	72 N•m	53 lb ft
Lower Jounce Control Arm Pivot Bolt	237 N•m	175 lb ft
Shock Absorber Nut	80 N•m	59 lb ft
Shock Absorber Tennon Nut	20 N•m	15 lb ft



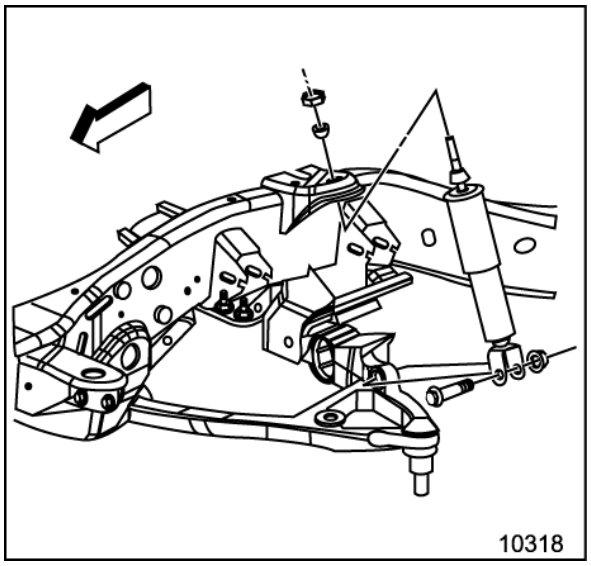
Repair Instructions

Shock Absorber Replacement

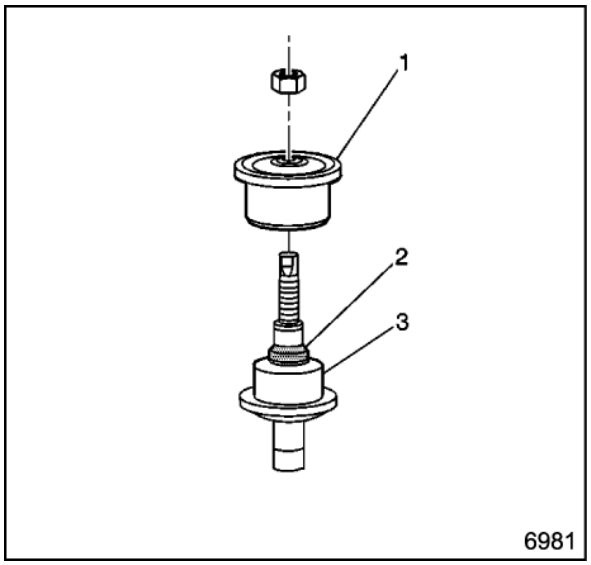
Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

Notice: The front shock absorbers of the vehicle are multifunctional. In addition to contributing to a smooth ride they also provide the only stop to the front suspension when fully extended. Therefore, when servicing the shock absorber, service replacement shock absorbers must be equivalent to original shock absorbers in both extended length and strength. Use of shocks not complying to original equipment or strength could result in suspension over-travel or shock breakage. Suspension over-travel may result in suspension component breakage.

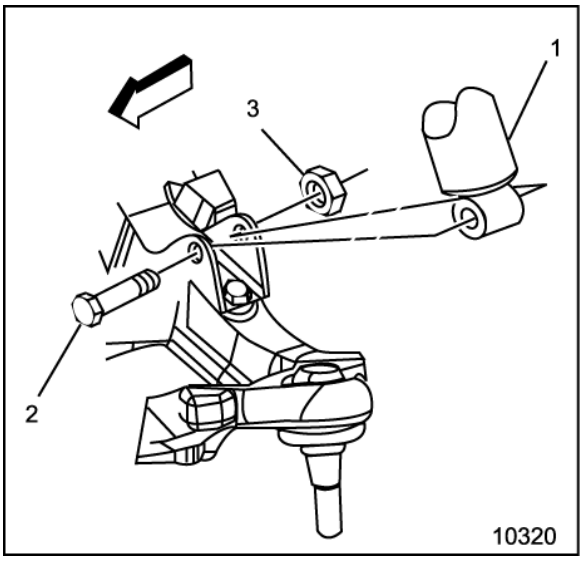


1. Raise and Support the vehicle.
2. Support the lower control arm with a jack stand.
3. Hold the tennon end with a wrench while removing the nut.
4. Remove the nut.



5. Remove the upper insulator (1).

6. Remove the shock absorber mounting bolt (2) and nut (3) at the lower control arm.
7. Remove the shock absorber (1).

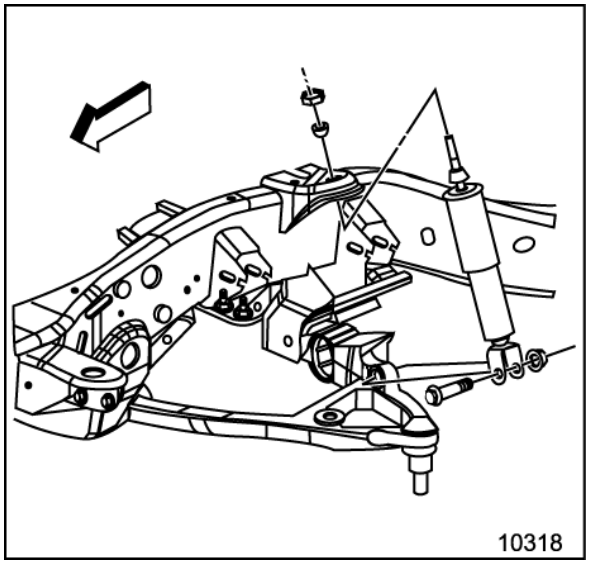


Installation Procedure

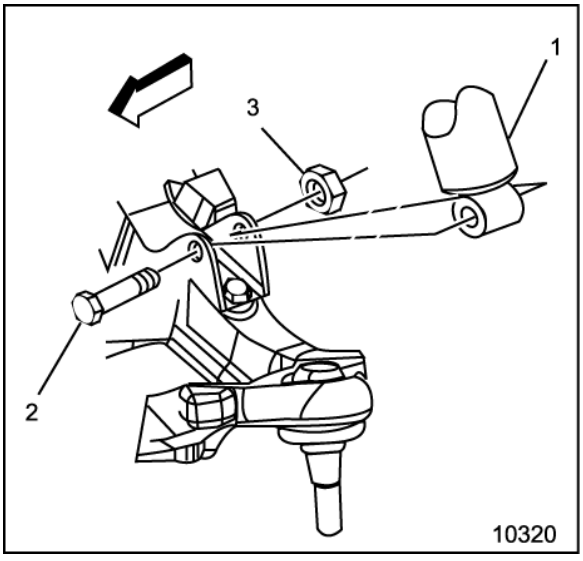
1. Install the shock absorber. Insert the stem through the hole in the shock bracket on the frame.
2. Align the shock absorber with the mounting holes in the lower control arm.
3. Install the shock absorber through bolt (2) to the lower control arm and shock.

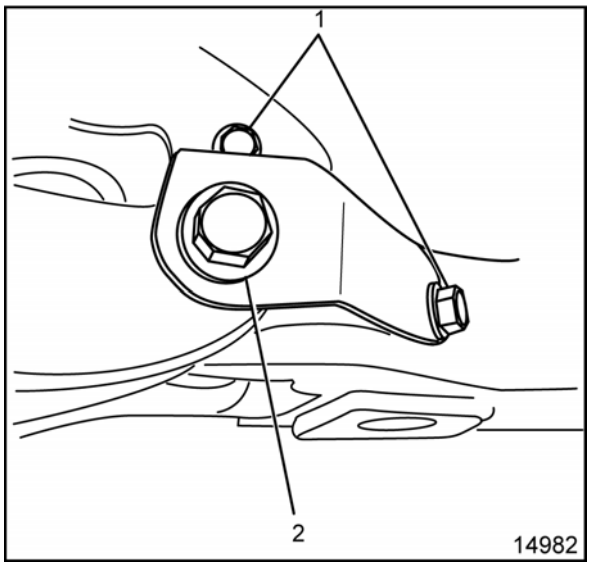
Notice: Refer to Fastener Notice in Cautions and Notices.

4. Install the shock absorber through bolt nut (3).
   Tighten
   Tighten the nut to 80 N•m (59 lb ft).
5. Install the upper insulator to the shock absorber.



6. Install the nut to the tennon end. Hand-tighten only.
7. Remove the safety stands.
8. Lower the vehicle.
9. Hold the tennon end with a wrench while torquing the nut.
   Tighten
   Tighten the nut to 20 N•m (15 lb ft).



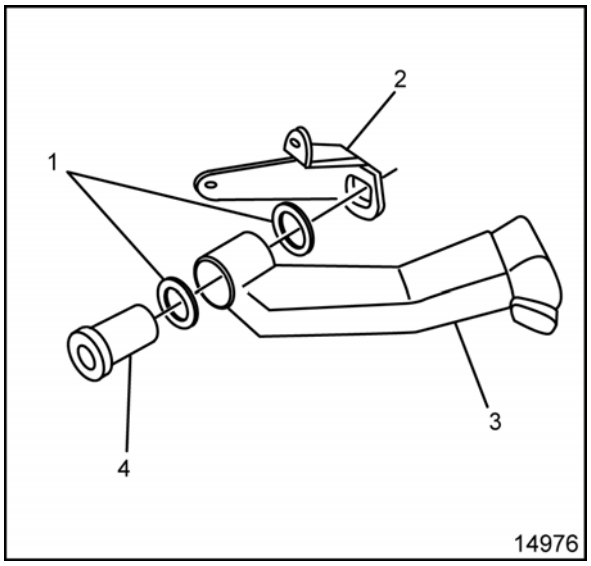


Lower Jounce Control Arm Replacement

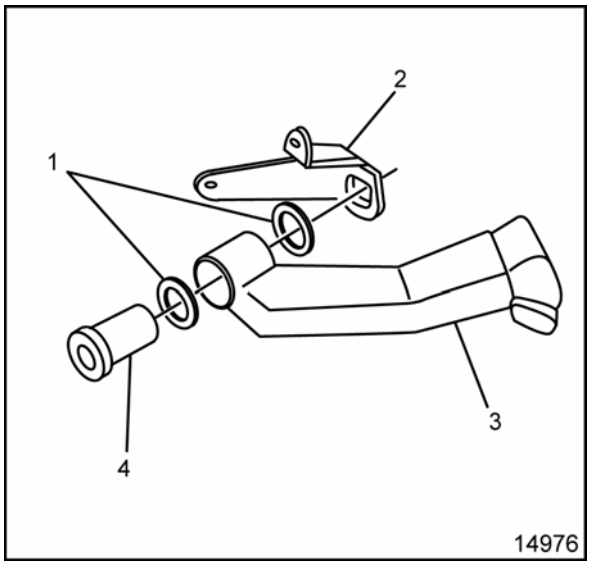
Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and support the vehicle with safety stands.
2. Remove the tire and wheel. Refer to Tire and Wheel Replacement in Tires and Wheels.
3. Remove the jounce shock absorber. Refer to Front Jounce Shock Absorber Replacement.
4. Remove the 2 control arm brace bolts (1).
5. Remove the control arm pivot bolt (2) and washer.



6. Remove the control arm brace (2).
7. Remove the outer shim (1).
8. Remove the control arm (3).
9. Inspect both shims (1) and pivot nut (4). Replace if worn.

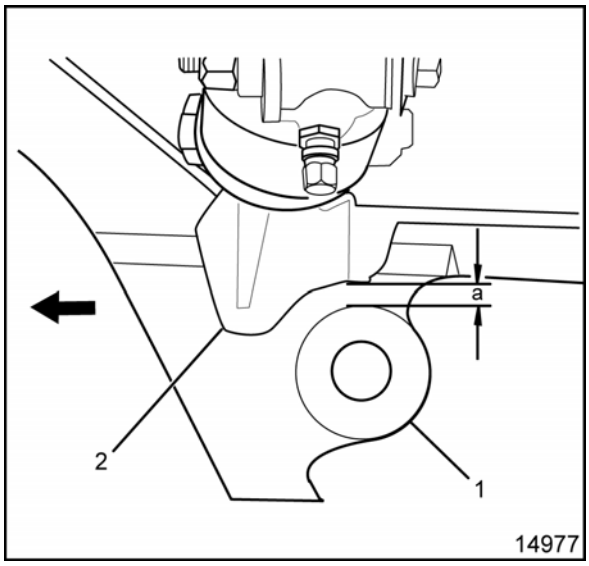


Installation Procedure

1. Install the inner shim (1) and control arm (3) onto the pivot nut (4).

2. Verify that the alignment of the jounce lower control arm (2) and stabilizer bushing link (1) of the factory control arm are within the specification. Add shims until the specification is correct.

   Specification A
   5mm +/- 3.5 mm (0.20 in +/- 0.14 in)

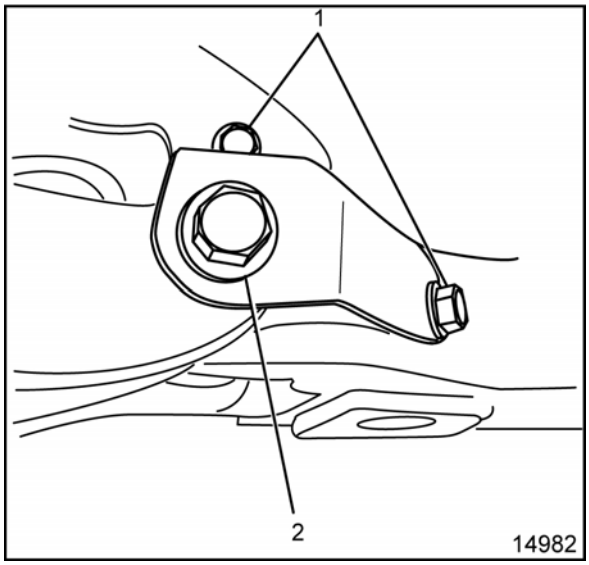


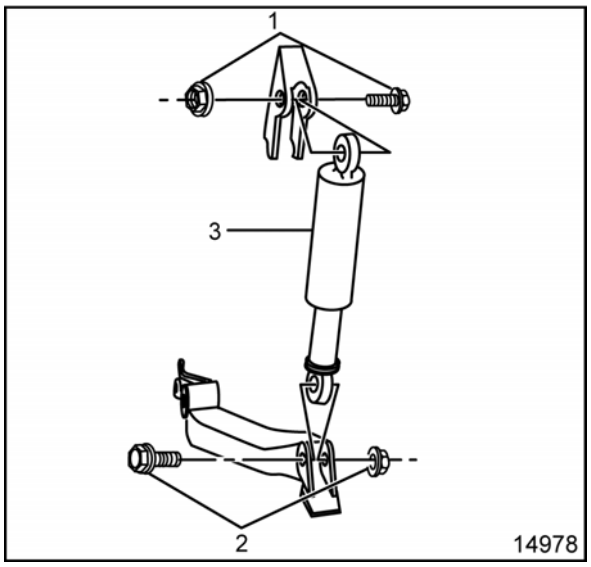
3. Install the outer shim and control arm brace, ensure that the pivot nut and brace slots are aligned.

Notice: Refer to Fastener Notice in Cautions and Notices.

4. Install the 2 brace bolts (1) and tighten.
   Tighten
   Tighten bolts to 72 N•m (53 lb ft).
5. Install the washer and pivot bolt (2).
   Tighten
   Tighten bolt to 237 N•m (175 lb ft).
6. Verify the control arm pivots freely and that the final alignment is correct.

7. Install the jounce shock absorber. Refer to Front Jounce Shock Absorber Replacement.
8. Install the tire and wheel. Refer to Tire and Wheel Replacement in Tires and Wheels.
9. Remove the safety stands and lower the vehicle.





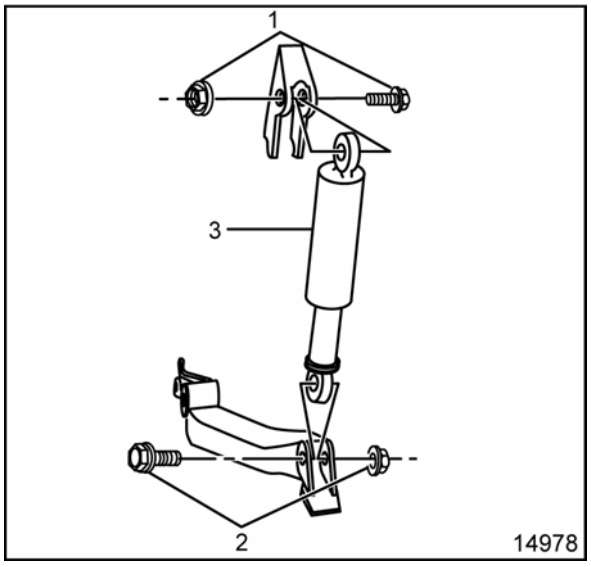
Jounce Shock Absorber Replacement

Important: Do not discharge the internal pressure of the jounce shock. The loss of oil during discharge may affect the performance setting.

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and support the vehicle with safety stands.
2. Remove the tire and wheel. Refer to Tire and Wheel Replacement in Tires and Wheels.
3. Remove the lower shock nut and bolt (2).
4. Remove the upper shock nut and bolt (1).
5. Remove the jounce shock (3) from the vehicle.



Installation Procedure

1. Install the jounce shock (3) onto the vehicle. Ensure that the pressure fitting is facing the outside of the vehicle.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the upper nut and bolt (1).
   Tighten
   Tighten bolt to 125 N•m (92 lb ft).
3. Install the lower nut and bolt (2).
   Tighten
   Tighten bolt to 125 N•m (92 lb ft).
4. Install the tire and wheel. Refer to Tire and Wheel Replacement in Tires and Wheels.
5. Remove the safety stands and lower the vehicle.

Description and Operation

Front Enhanced Suspension

The front suspension has 2 primary purposes:

- Isolate the driver from irregularities in the road surface.
- Define the ride and handling characteristics of the vehicle.

The front suspension absorbs the impact of the tires traveling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. Ride characteristics are designed into the suspension system and are not adjustable.

A heavy-duty shock absorber is used in conjunction with heavy-duty hydraulic bumpers or struts to absorb dissipative energy at the end of the road wheel arm jounce travel. This enhanced system will dampen out the oscillations of the torsion bar spring.

Front Shock Absorber Description

A shock absorber is a basic hydraulic cylinder. The shock is filled with oil and has a moveable shaft that connects to a piston inside the shock absorber. Valves inside the shock absorber offer resistance to oil flow and consequently inhibit rapid movement of the piston and shaft. The top of the shock is mounted to the frame and the lower is mounted to the lower control arm.

Front Hydraulic Jounce Bumper Description

A hydraulic jounce bumper is a basic hydraulic cylinder. The hydraulic jounce bumper aids the shock absorber in increased energy absorption and improved endurance. The top of the jounce bumper is mounted to the frame and the lower is mounted to the lower control arm. The hydraulic jounce bumper is used in conjunction with the factory jounce bumper.

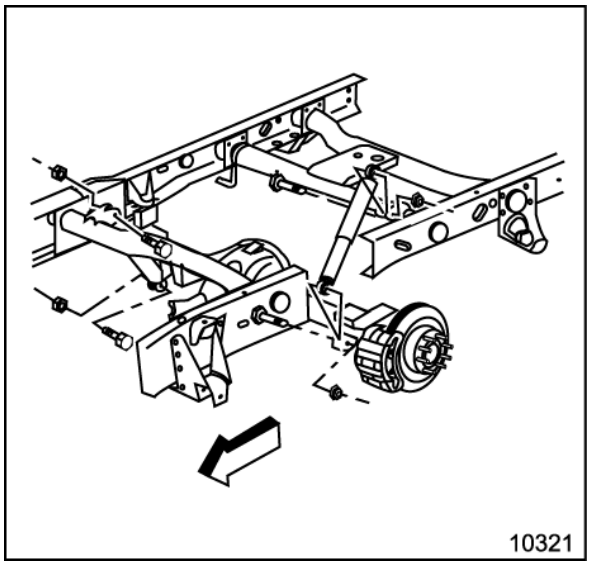
BLANK

Rear Suspension

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Jounce Shock Frame Mount Bracket Bolts	72 N•m	53 lb ft
Jounce Shock to Mount Bolt	13 N•m	9.6 lb in
Shock Absorber Cover Bolts	35 N•m	26 lb ft
Shock Absorber Lower Nuts	95 N•m	70 lb ft



Repair Instructions

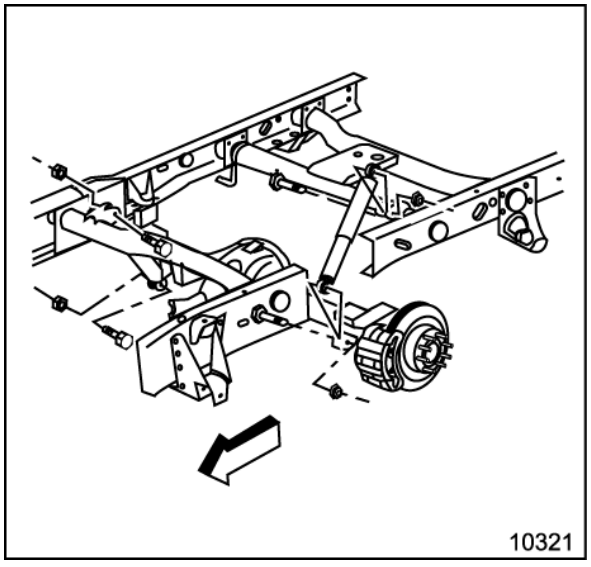
Shock Absorber Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

Notice: Original equipment shock absorbers serve additionally as suspension drop cutoffs. Replacement shock absorbers must have a built in suspension cutoff feature and must not be longer than original shocks when they are fully extended or serious vehicle or component damage could result.

1. Raise and support the vehicle.
2. Remove the upper shock absorber nut and bolt.
3. Remove the lower shock absorber nut and bolt.
4. Remove the shock absorber.

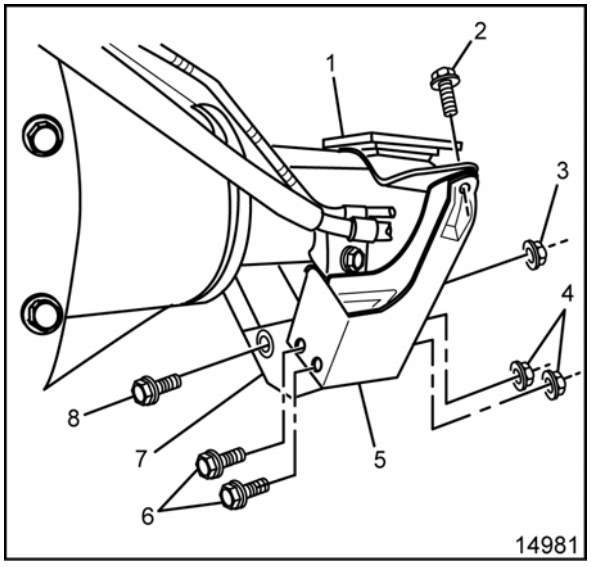


Installation Procedure

1. Install the shock absorber.
2. Install the upper shock absorber nut and bolt.

Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install the lower shock absorber nut and bolt.
   Tighten
   Tighten the upper and lower nuts to 95 N•m (70 lb ft).
4. Remove the safety stands.
5. Lower the vehicle.



Shock Absorber Cover Replacement - Left

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

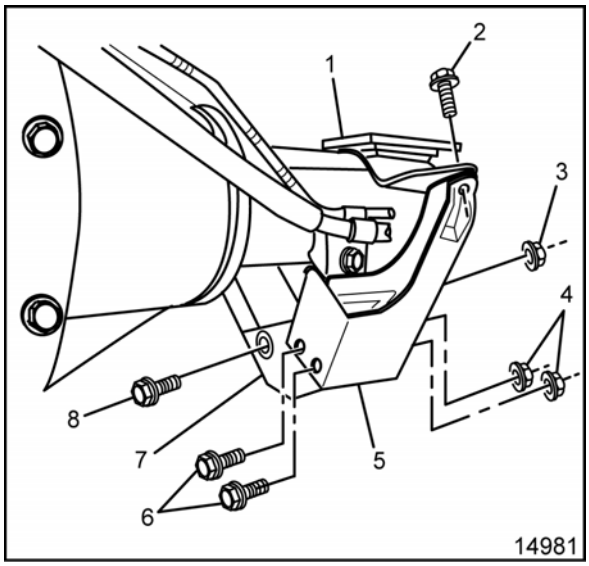
1. Raise and support the vehicle.
2. Remove bolts (6) and nuts (4) from the cover.
3. Remove bolt (2) from the shock cover.
4. Remove nut (3) and bolt (8) from the shock.
5. Remove shock covers pieces (1, 5, 7) from the axle housing.

Installation Procedure

1. Install the shock cover pieces (1, 5, 7). Ensure that the tab in cover piece (1) fits into the slot in cover piece (5).
2. Install bolt (2) at the top of the cover.
3. Install shock bolt (8) and nut (3).
4. Install bolts (6) and nuts (4).

Notice: Refer to Fastener Notice in Cautions and Notices.

5. Ensure that the contact pad of the jounce shock is aligned with the jounce shock.
   Tighten
   - Tighten lower shock bolt to 95 N•m (70 lb ft).
   - Tighten shock cover bolts to 35 N•m (26 lb ft).
6. Remove supports and lower the vehicle.

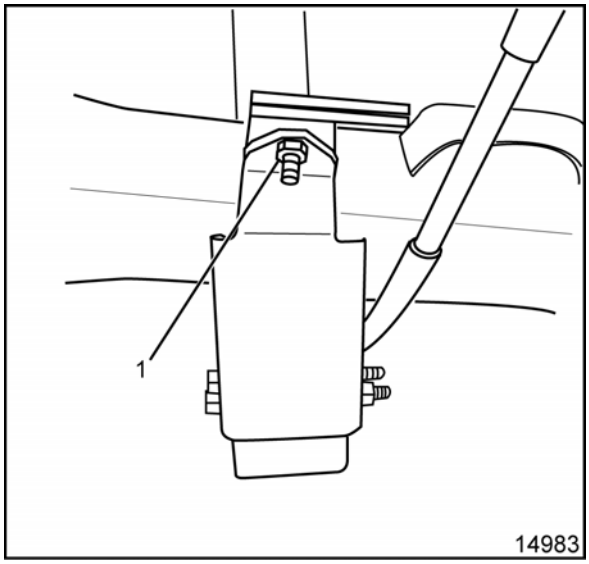


Shock Absorber Cover Replacement - Right

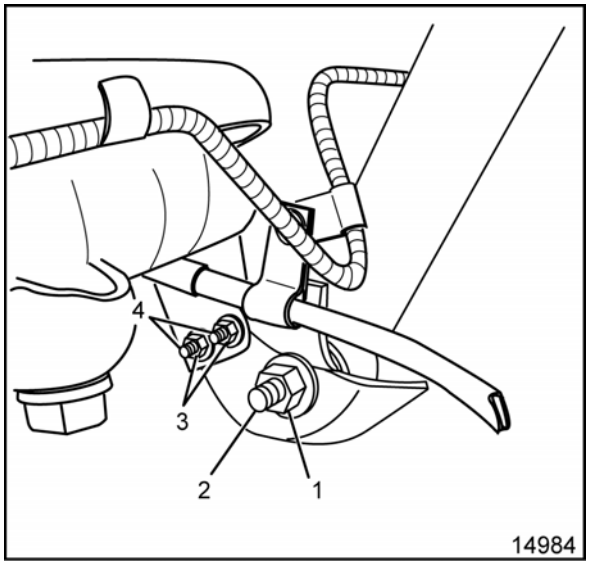
Removal Procedure

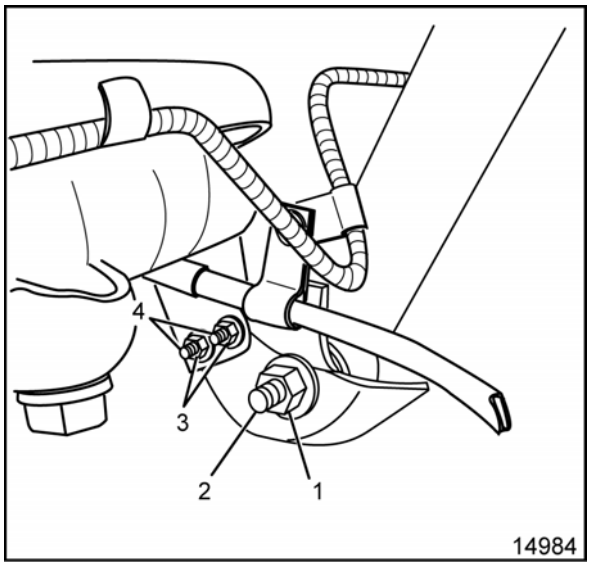
Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and Support the vehicle.
2. Remove the top cover bolt (1).



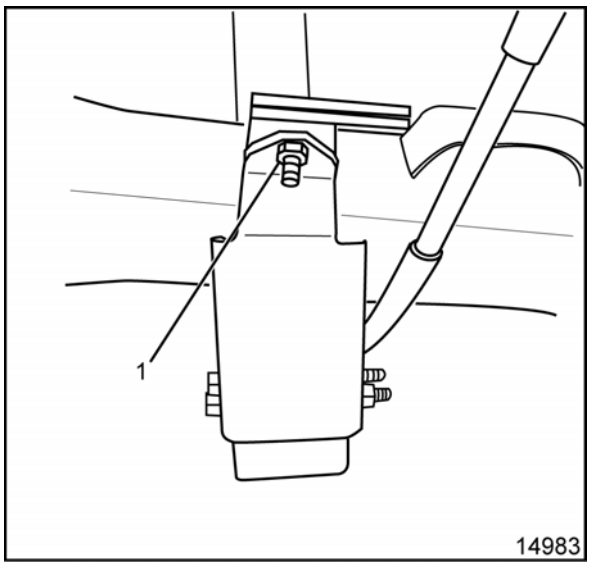
3. Remove shock cover nuts (3) and bolts (4).
4. Remove the lower shock nut (1) and bolt (2).
5. Remove the shock cover pieces from the axle.





Installation Procedure

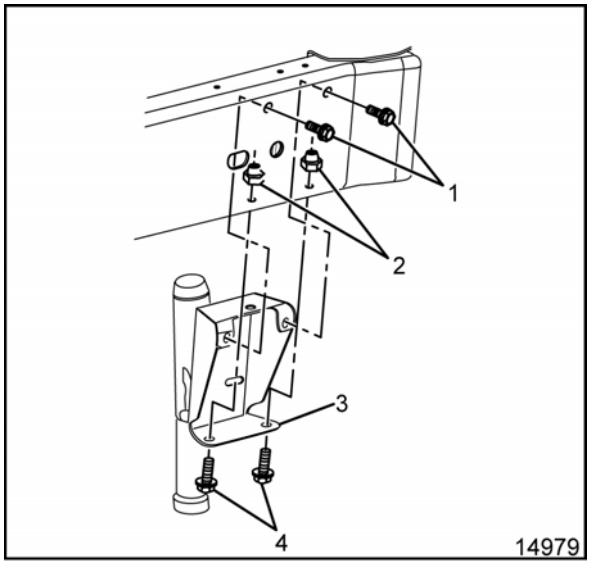
1. Install the shock cover pieces on the axle. Ensure that the tab on the upper cover is in the slot of the lower cover.
2. Install the lower shock bolt (2) and nut (1).
3. Install bolts (4) and nuts (3) into the shock cover.



4. Install the top shock cover bolt (1).

Notice: Refer to Fastener Notice in Cautions and Notices.

5. Ensure that the contact pad of the jounce shock is aligned with the jounce shock.
   Tighten
   - Tighten lower shock bolt to 95 N•m (70 lb ft).
   - Tighten shock cover bolts to 35 N•m (26 lb ft).



Rear Jounce Shock Absorber Mount Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

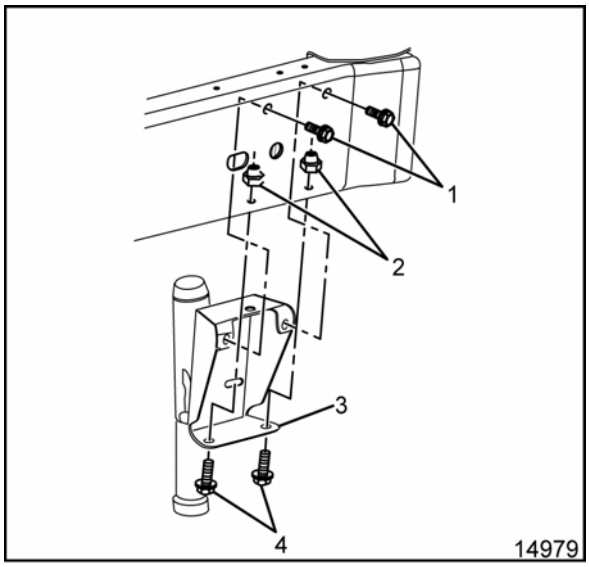
1. Raise and support the vehicle with safety stands.
2. Remove the nuts (2) and bolts (4) from the mount.
3. Remove bolts (1) from the mount.
4. Remove the mount (3) and shock as an assembly from the vehicle.

Installation Procedure

1. Install the mount (3) and shock into position on the vehicle.

Notice: Refer to Fastener Notice in Cautions and Notices.

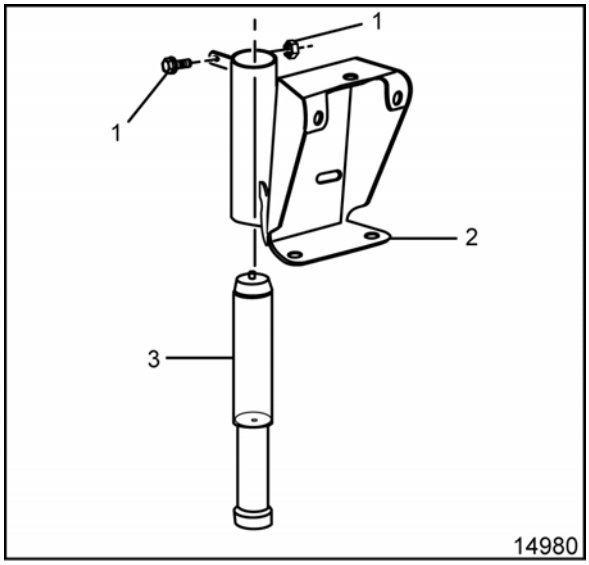
2. Install bolts (1) through frame and into the mount.
   Tighten
   Tighten bolts to 72 N•m (53 lb ft).
3. Install bolts (4) and nuts (2) into mount.
   Tighten
   Tighten nuts and bolts to 72 N•m (53 lb ft).
4. Remove safety stands and lower vehicle.



Rear Jounce Shock Absorber Replacement

Removal Procedure

1. Remove the rear jounce shock absorber mount. Refer to Rear Jounce Shock Absorber Mount Replacement.
2. Remove the nut and bolt (1) from the rear mount (2).
3. Remove the jounce shock (3) by slipping it out of the mount (2).

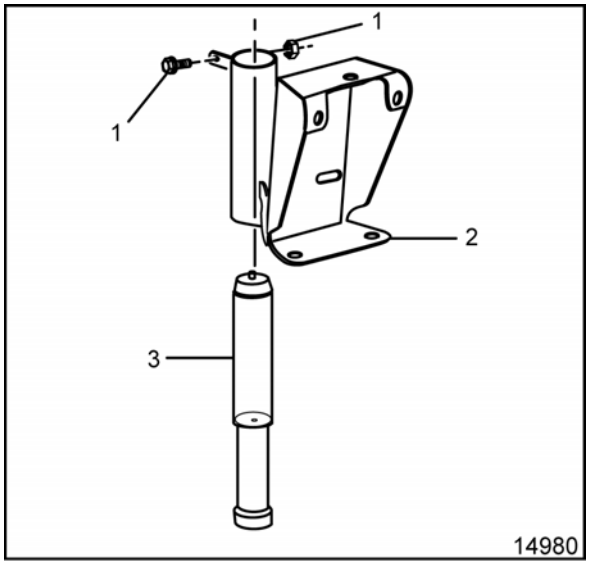


Installation Procedure

1. Slide the jounce shock (3) into the mount (2).

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the nut and bolt (1) through the mount.
   Tighten
   Tighten nut and bolt to 13 N•m (9.6 lb in).
3. Install the rear jounce shock mount. Refer to Rear Jounce Shock Mount Replacement.



Description and Operation

Rear Enhanced Suspension

All models use a rear spring suspension system and a solid rear axle suspension system. The rear axle is attached to the multi-rear springs by U-bolts. The front of the spring ends are attached to the frame at the front hangers through rubber bushings. The rear of the spring ends are attached to the frame with shackles that allow the springs to change their length, due to the spring compressing, while the vehicle is in motion. Two identical direct dual-action shock absorbers and hydraulic jounce bumpers provide the ride control. The jounce bumpers are frame mounted. The rear spring steel stabilizing shaft helps minimize body roll and sway during cornering. The rear stabilizer shaft is connected to the rear axle and the frame with the following components:

- The rubber insulators
- The clamps
- The link assemblies

Rear Shock Absorber Description

The suspension features a heavy-duty shock absorber package necessary for off-road conditions. A shock absorber is a base hydraulic cylinder. The shock is filled with oil and has a moveable shaft that connects to a piston inside the shock absorber. Valves inside the shock absorber offer resistance to oil flow and consequently inhibit rapid movement of the piston and shaft. The shocks are angle-mounted between the frame and the brackets, which are attached to the axle tubes.

Rear Shock Absorber Cover Description

The suspension features heavy-duty shock absorber covers that protect the shock absorber against damage from severe off road usage while providing full function suspension.

Rear Hydraulic Jounce Bumper

A hydraulic jounce bumper is a basic hydraulic cylinder. The hydraulic jounce bumper aids the shock absorber in increased energy absorption and improved endurance. The jounce bumper is mounted to the frame above the rear axle.

Tires and Wheels

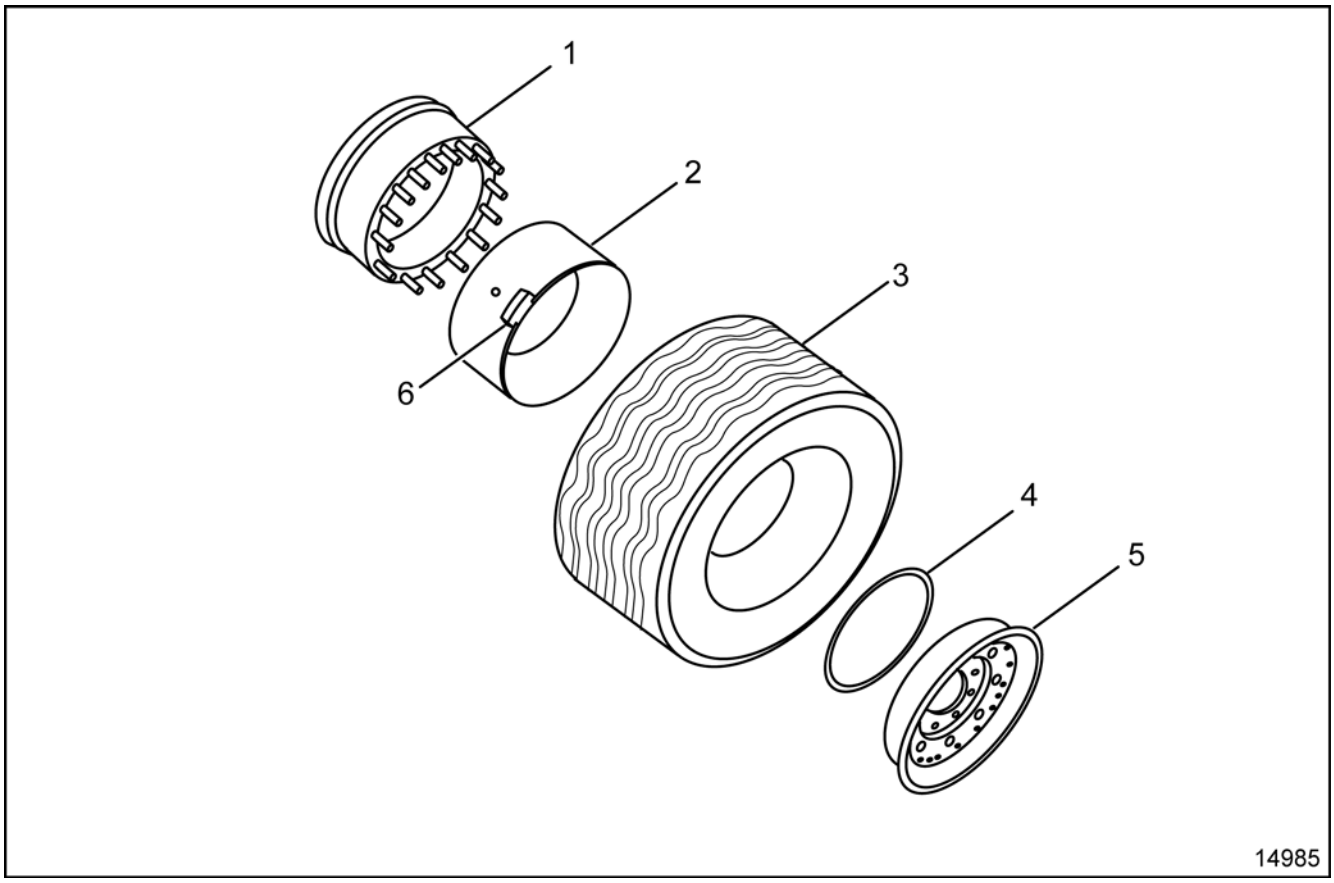
Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Jack Mounting Bracket Bolt	53 N•m	39 lb ft
Jack Mounting Bracket Nut	53 N•m	39 lb ft
Spare Tire Carrier Hex Bolts	35 N•m	26 lb ft
Spare Tire Carrier Torx Bolts	53 N•m	39 lb ft
Wheel Air Valve	7-8 N•m	5-6 lb ft
Wheel Nuts (First Pass)	81 N•m	60 lb ft
Wheel Nuts (Second Pass)	102-108 N•m	75-80 lb ft

Component Locator

Enhanced Mobility Wheel



Legend

(1) Rear Half of Wheel
(2) Beadlock
(3) Tire
(4) O-ring Seal
(5) Front Half of Wheel
(6) Tire Pressure Monitor

Repair Instructions

Tire Mounting and Dismounting Procedure

Tools Required

D528235-H1 Run Flat Lubricant

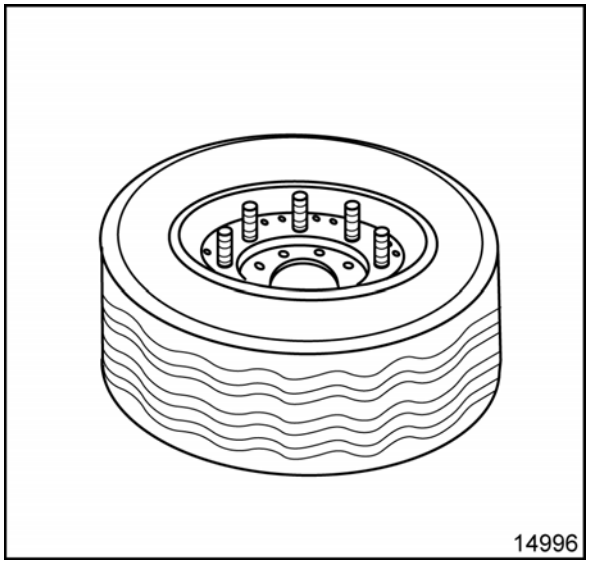
Caution:

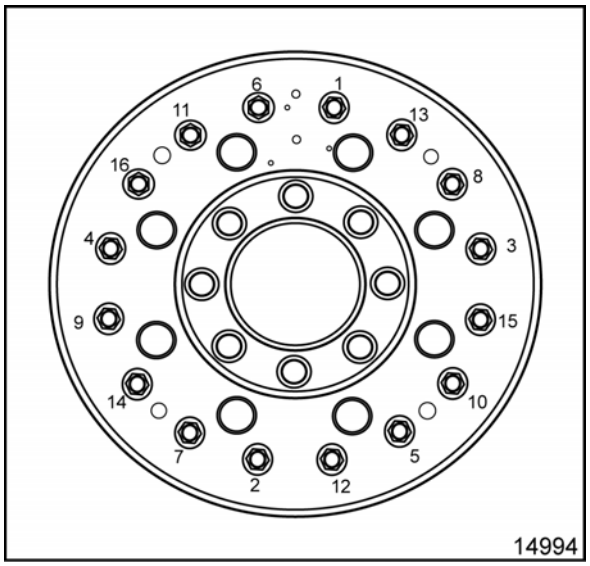
- ***The wheel rim nuts must be replaced whenever the tire is changed.***
- ***Failure to properly match tire and rim/wheel sizes is dangerous. Mounting a smaller diameter tire on a larger rim diameter rim/wheel (for example, mounting a 16 inch tire on a 16.5 inch rim/wheel) can result in breaking the tire bead during mounting or airing. The tire may then explode during inflation. The explosion can hurl the tire and wheel into the air striking you or others. Be sure the diameter shown on the tire exactly matches the diameter stamped on the rim/wheel.***
- ***Excess paint can cause nut loosening which could result in loose wheels or premature wheel failure. This could cause an accident or injury.***
- ***Use of damaged parts is very dangerous. These parts can fail during inflation, later handling, or while on the vehicle. You or someone else could receive serious or fatal injuries.***
- ***Dirt and corrosion can prevent rim components from seating properly or cause a bead hang-up (tire bead not seating properly). Assembling such components can lead to explosive separation, resulting in serious or fatal injury.***
- ***Do not attempt to disassemble a wheel assembly while the tire is fully inflated. Serious injury may result.***
- ***Tire and beadlock are brand and size matched for this application. If a different tire brand or size is used, then a different beadlock may be required. Failure to match the components can result in damage to components and possible loss of vehicle control.***

Dismounting Procedure

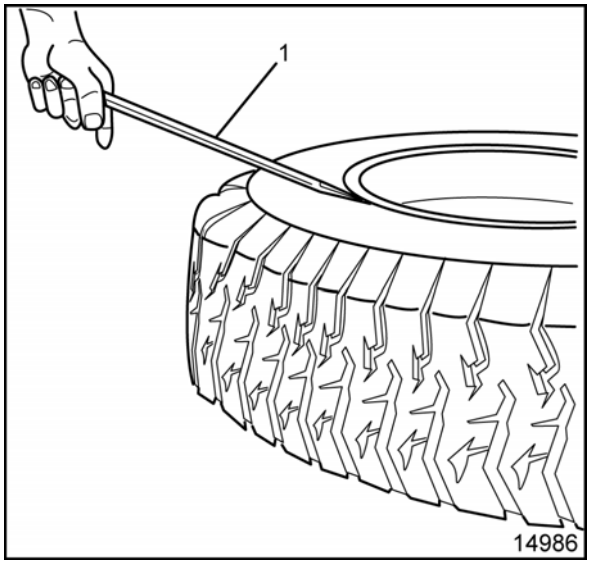
Outer Half

1. Remove the air valve core to fully deflate the tire. Ensure that valve air passage is not blocked.
2. Remove all balance weights from the wheel flange.
3. Place the tire on a flat surface with the nuts facing up.

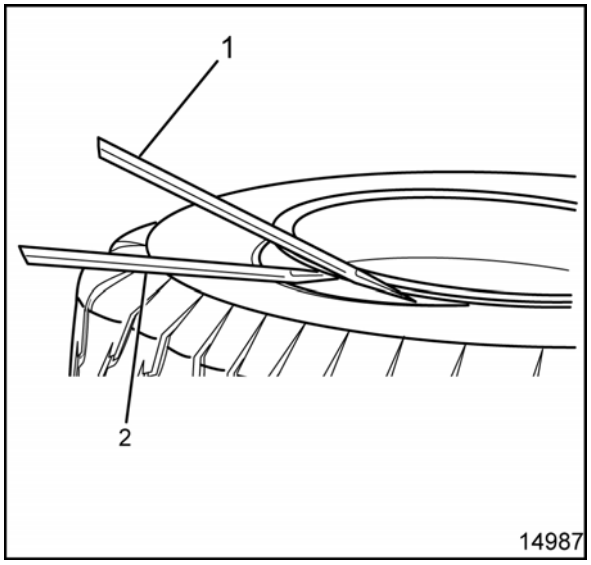




4. Loosen all the nuts in a star pattern until all the nuts have been removed.



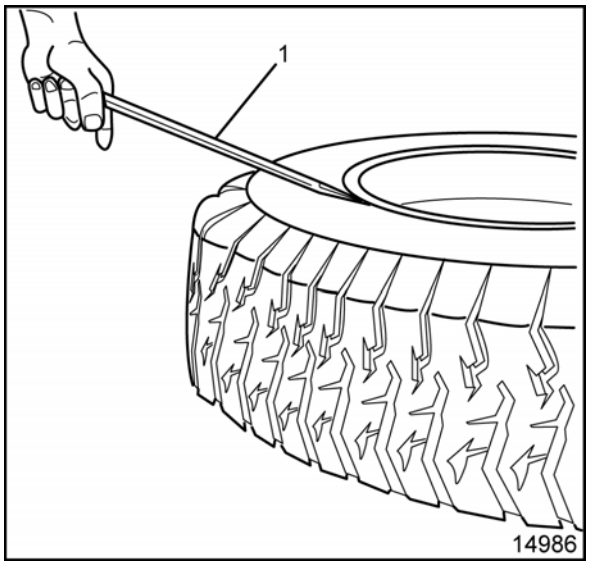
5. Apply tire soap to the edge of the outer rim flange.
6. Using a tire spoon and a (7/16 in) wide blade pry bar, gently pry the outer flange away from the tire bead in 3 points as follows:
   - Install the tire spoon (1) between the flange and the tire and pull down until the spoon is horizontal with the working surface.



   - Install the pry bar between the flange and the tire then push up. The blade of the pry bar will push the tire down and off of the 5° beadseat.
   - Using the tire spoon (2) and pry bar (3) at intervals of 45°, work around the wheel and tire.
   - Remove the outer wheel from the tire and remove the O-ring and discard.

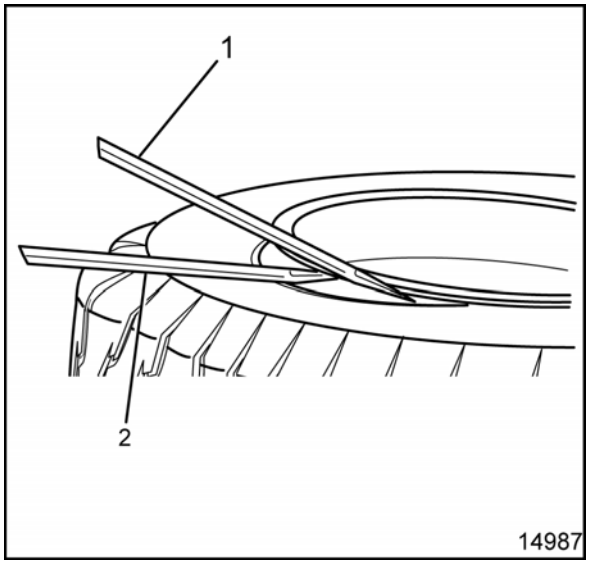
Note: Ensure that the wheel half is placed with the O-ring side facing up to avoid scratching the surface.

7. Flip the tire assembly over and apply tire soap to the inner flange.
8. Using the pry bar and tire spoon, gently pry the inner flange from the tire bead as follows:
   - Using the tire spoon (1) between the flange and tire, push the tire spoon down until it is horizontal to the working surface to lift the wheel flange up.

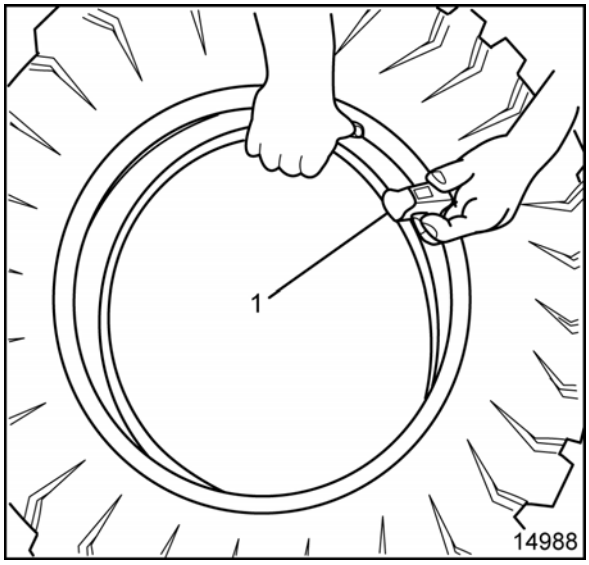


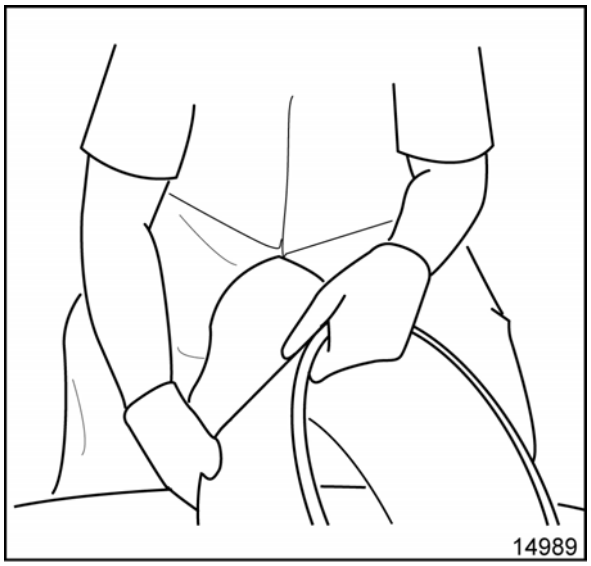
   - Using the pry bar between the flange and tire push the tire bead down. The pry bar will push the tire down and off of the 5° bead seat.
   - Using the prybar (1) and tire spoon (2) work your way around the tire at intervals of 45°.
   - Remove the inner wheel half from the tire.

Note: Ensure that the wheel half is placed with the O-ring side facing up to avoid scratching the surface.



9. Locate the air pressure sensor (1) and compress the beadlock insert down enough to expose the sensor.
10. Remove the sensor from the beadlock insert.





11. Stand the tire on end allowing one side of the beadlock to fall off-center into the tire chamber.
12. Place the tire back on the ground and compress the beadlock in an oval shape and twist and pull out of the tire cavity.

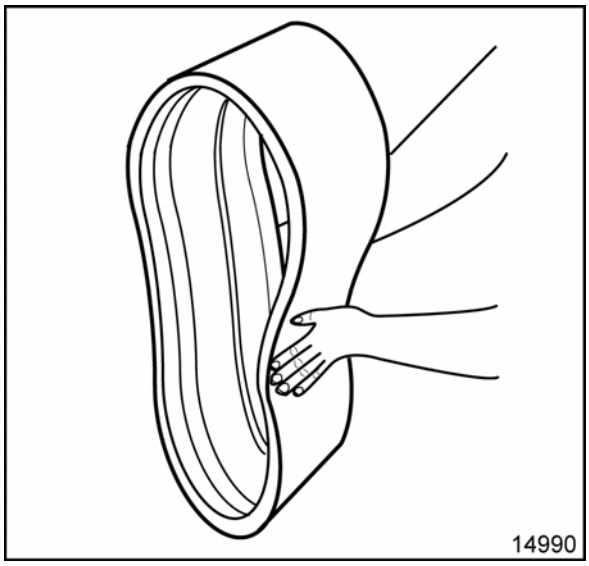
Cleaning and Inspection Procedure

1. Clean the following areas:
   - Degrease the rim bead seats with denatured alcohol and dry with a clean towel. Allow to dry.
   - Clean the tire beads with a clean towel, to remove any dirt or foreign materials.
   - Clean the beadlock edges with a clean towel and remove any foreign materials.
   - Wipe the O-ring groove with a clean towel and remove any foreign material from the groove.
   - Clean the mating surfaces on the outer and inner wheel halfs.

2. Inspect the following areas:
   - Outer wheel half for wear, damage or warpage.
   - Inner wheel half for wear, damage or warpage.
   - Beadlock for wear or damage.
   - Replace any worn or damaged parts.

Mounting Procedure

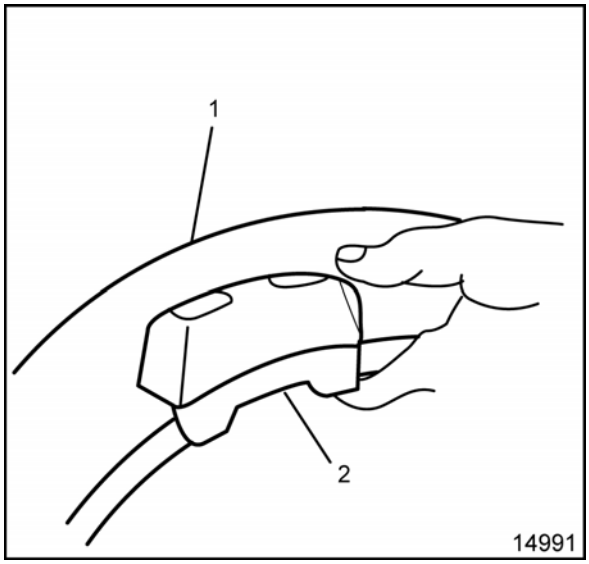
1. Place the tire on a horizontal surface. Compress the beadlock from its round shape into an oval.
2. Holding the beadlock with both hands, rotate it and place it into the tire cavity.



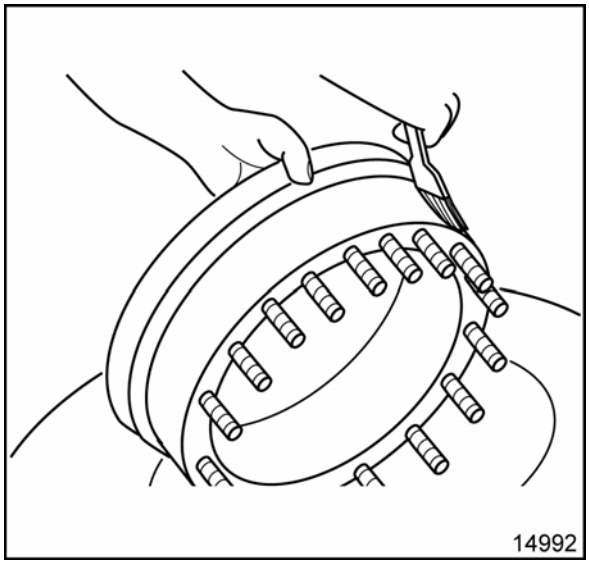
Note sensor color for reference of tire location on vehicle.

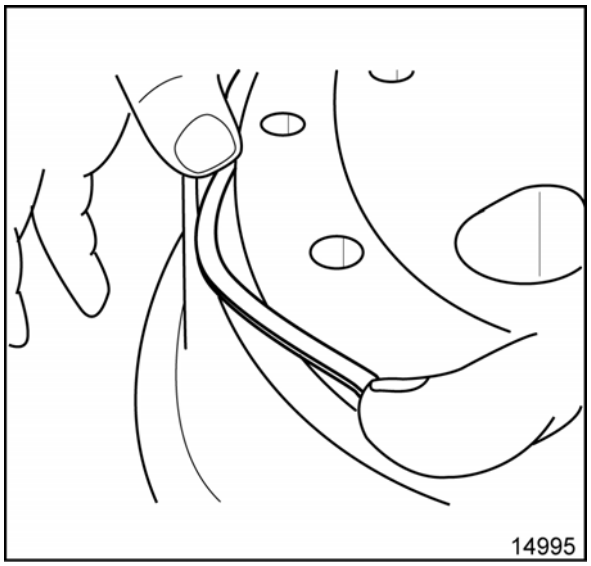
3. Install the tire pressure sensor assemble (1) within the beadlock groove (2).

Important: The sensor must be opposite one of the two beadlock grooves (2).



4. Position the beadlock, centering it between the tire beads.
5. Lubricate the inner edge of the beadlock wheel and tire beads with tire soap to aid installation of the wheel.

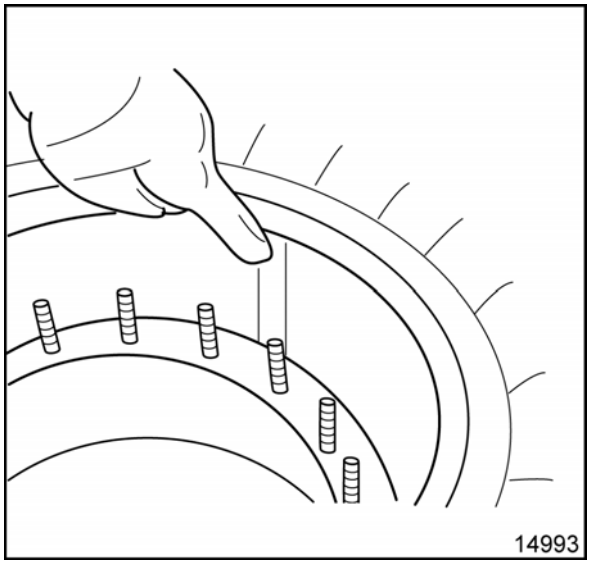




6. Center the wheel air fitting with one of the grooves in the beadlock and press inner wheel into tire.

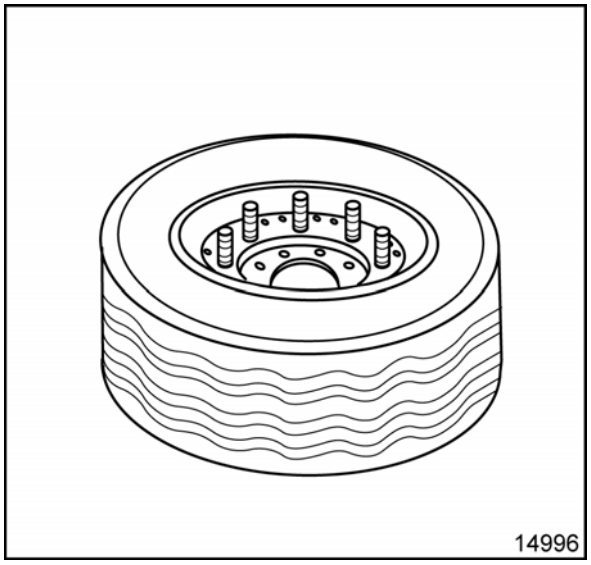
Notice: Refer to Fastener Notice in Cautions and Notices.

7. Install the air valve into the rim if a rubber valve is used install by pulling into position, if a metal valve is used, apply Loctite to the threads of the air valve. Install it into the wheel and tighten.
   Tighten
   Tighten the valve nut to 7-8 N•m (5-6 lb ft).
8. Apply the color indicator washer that matches the pressure sensor to the air valve or mark with paint.
9. On the outer wheel apply a small amount of run flat lubricant to the O-ring groove and install the O-ring. Remove excess of lubricant.



Important: Ensure that both inner wheel sealing surfaces are completely free of any debris.

10. Install the outer wheel into the tire. Ensure that the air fitting is in line with one of the grooves.

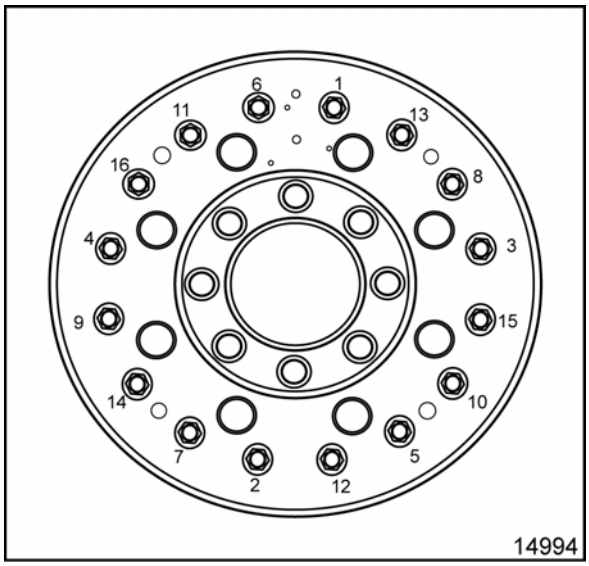


11. With the inner wheel studs facing up and install the wheel nuts by hand to a minimum of 4 threads.

Important: The specified torque pattern must be followed to prevent damage or improper sealing.

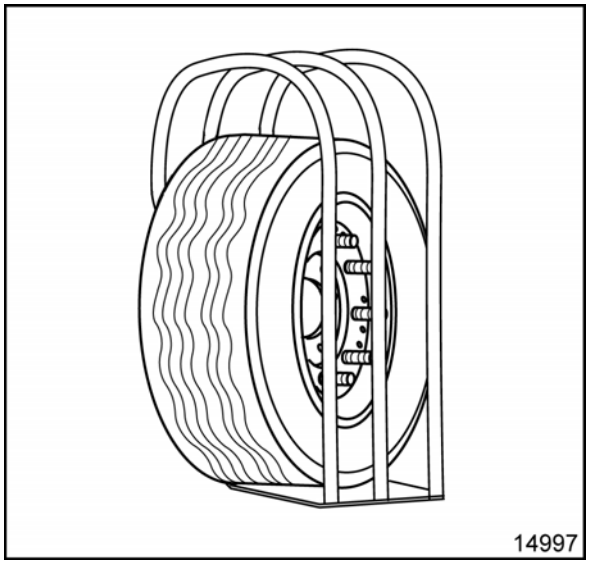
12. Using the torque pattern, tighten the nuts.
    Tighten
    - Tighten the wheel nuts (first pass) to 81 N•m (60 lb ft).
    - Tighten the wheel nuts (second pass) to 102 – 108 N•m (75 – 80 lb ft).

Important: Retorque wheel nuts in a star pattern at 80 – 161 KH (50 – 100 MI) and 8047 KH (5,000 MI) thereafter retorque to 102 –108 N•m (75 – 80 lb ft).

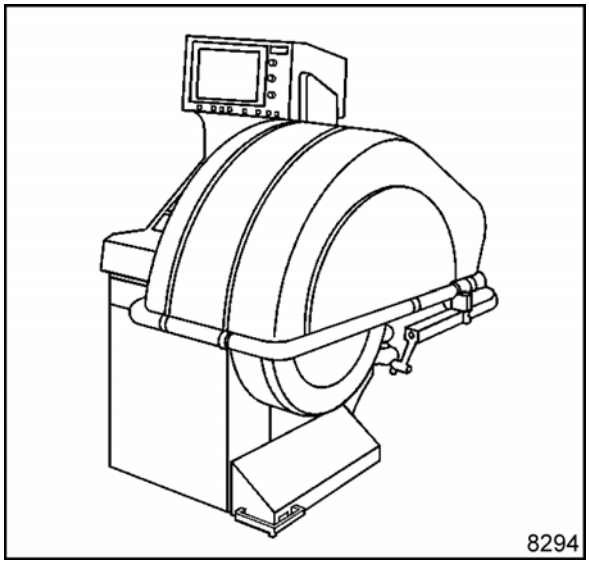


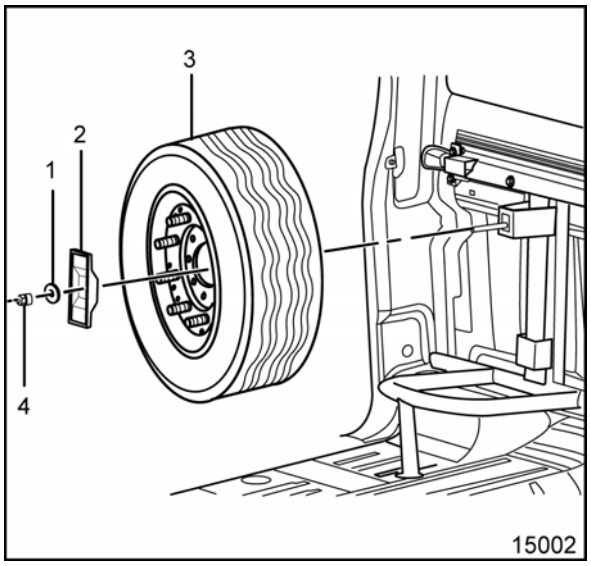
Caution: Inflating a tire with a hand held air chuck is dangerous. You can be seriously injured.

13. Place the tire in an approved inflation safety cage and inflate to 206 KPA (30 PSI).
14. Check the tire bead seating for space between the wheel flange and the tire. While the wheel is lying flat, inspect the entire circumference of the wheel flange. If this condition exists disassemble and restart by inspecting the O-ring.
15. Inflate the tire to air pressure and inspect for leaks, by placing the wheel in a water tank or letting it sit for 48 hours. If the pressure loss is less than 7 Kpa (1 Psi) the tire is acceptable for use.



16. Dynamically balance the tire using a maximum balance weight of (6 oz) per side. Refer to Tire and Wheel Balancing – Off Vehicle in the C/K Truck Service Manual.

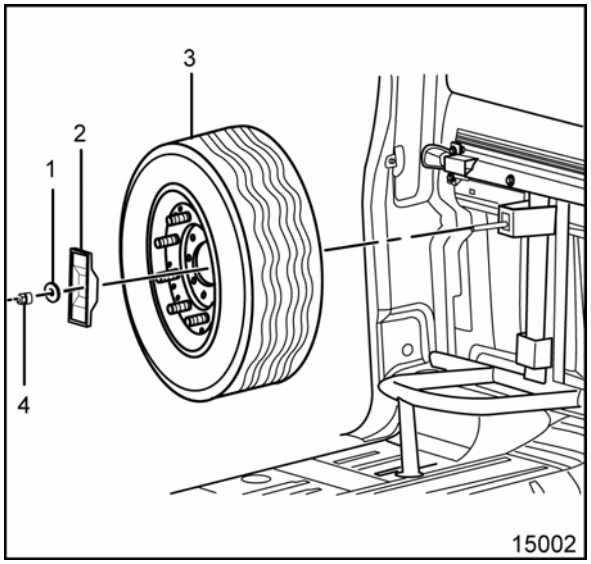




Spare Tire Replacement

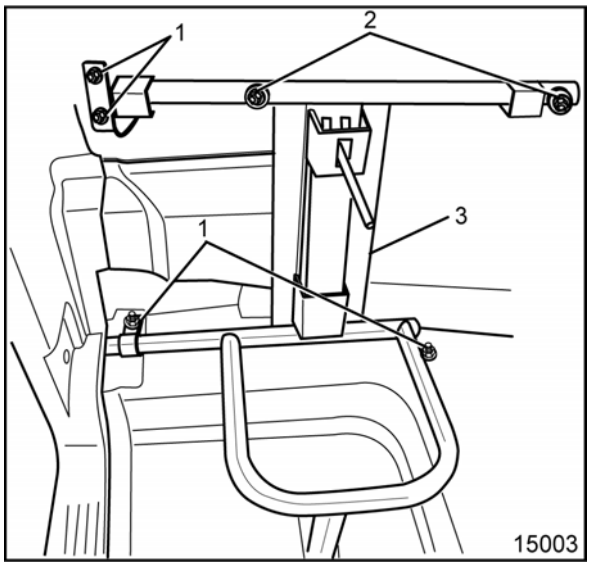
Removal Procedure

1. Remove the nut (4) and washer (1).
2. Remove the spare tire retainer (2).
3. With the aid of an assistant remove the spare tire (3) from the vehicle.



Installation Procedure

1. With the aid of an assistant, place the tire (3) into the carrier.
2. Install the retainer (2).
3. Install the washer (1) and nut (4).
   Tighten
   Tighten the nut to allow a minimum of 5 visible threads on the stud.

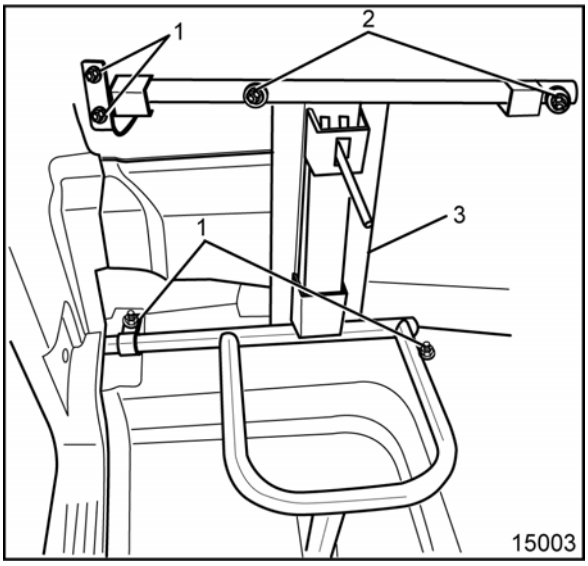


Spare Tire Carrier Replacement

Removal Procedure

1. Remove the spare tire. Refer to Spare Tire Replacement.
2. Remove the hex bolts (1) from the carrier.
3. Remove the torx bolts (2) from the carrier.
4. Remove the carrier (3) from the vehicle.

Installation Procedure

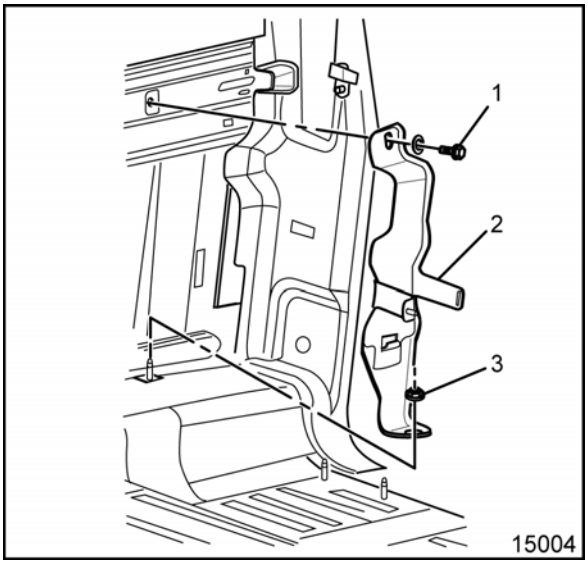


1. Install the carrier (3) into the vehicle.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the torx bolts (2) and tighten.
   Tighten
   Tighten the torx bolts to 53 N•m (39 lb ft).
3. Install the hex bolts (1) and tighten.
   Tighten
   Tighten the hex bolts to 35 N•m (26 lb ft).
4. Install the spare tire. Refer to Spare Tire Replacement.

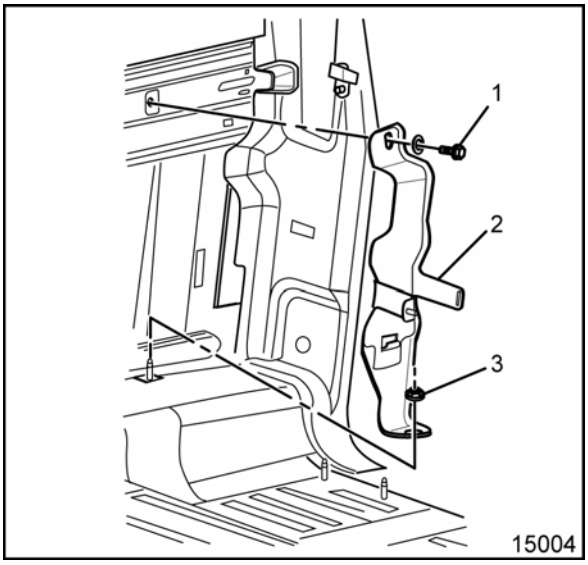
Jack Mounting Bracket Replacement



Removal Procedure

1. Remove the vehicle jack from the mount.
2. Remove the lower bracket nut (3).
3. Remove the upper bracket bolt (1) and washer.
4. Remove the mounting bracket (2).

Installation Procedure



1. Install the mount bracket (2) in the mounting position.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the washer and upper bracket bolt (1).
   Tighten
   Tighten the bolt to 53 N•m (39 lb ft).
3. Install the lower nut (3).
   Tighten
   Tighten the nut to 53 N•m (39 lb ft).
4. Install the vehicle jack in the mount.

Description and Operation

Tires and Wheels

Beadlock Tire System

The beadlock system can only be used on multiple-piece wheels. This device fits securely between the tire beads and positively locks the tire to the wheel rim flange. Beadlocks allow vehicle operations at the low tire air pressure conditions required for better mobility in mud, sand and snow. By reducing the air pressure, the tire footprint is increased significantly, thus allowing a greater area of traction or contact. The beadlock also performs as a safety device to insure that the tire does not “unseat” from the rim or rotate on the wheel at these low air pressure settings, while also preventing the entry of foreign objects, debris or water into the tire’s air chamber. It is used in conjunction with the tire pressure monitoring system.

Special Tools and Equipment

Illustration	Tool Number/Description
14999	**D528235-H1** Run Flat Lubricant

Tire Pressure Monitoring

Specifications

Tire Color Location

Color	Tire Number	Tire Location
Green	1	Right Front
Red	2	Left Front
Blue	3	Right Rear
Yellow	4	Left Rear

General Specifications

Application	Specification	
	Metric	English
Function Display		
Power Consumption	80 ma (min) to 110 ma (max)	
Operating Temperature	-29°C to 85°C	-20°F to 185°F
Display Dimensions	71mm x 19mm x 42 mm	2.8 in x 0.74 in x 1.64 in
Display Weight	43 gm	1.502
Operating Humidity	100% Non Condensing	
Function		
Cold Tire Inflation	.70 to 5.20 Bar	10 to 76 PSI
Low Pressure Warning	.33 to 6.35 Bar	5 to 95 PSI
Pressure Deviation Alert	.15 – 1.40 Bar	-2 to - 20 PSI
High Temperature Alert	30°C to 120°C	86°F to 248°F
Slope	10 - 160	
Units of Temperature	°C	°F
Units of Pressure	Bar	PSI
Number of Tires Monitored	20	

Tire Pressure Monitoring System Settings

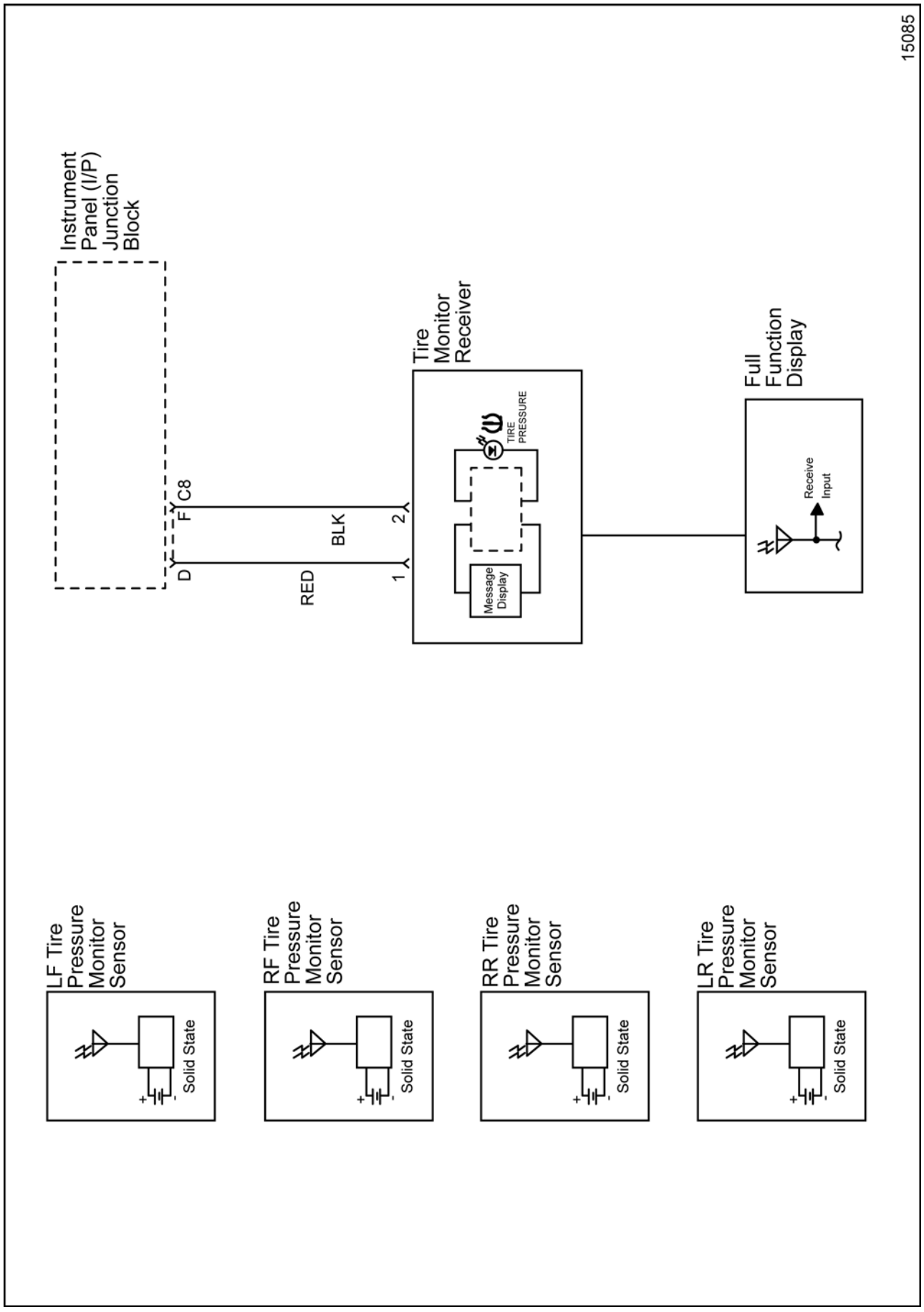
Terrain	Cold Inflation Pressure	Low Pressure Warning	Slope
Highway	2.76 Bar (40 PSI)	2.07 Bar (30 PSI)	51
Cross Country	1.60 Bar (23 PSI)	1.17 Bar (17 PSI)	34
Mud, Sand, Snow	1.24 Bar (18 PSI)	0.90 Bar (13 PSI)	29

Tire Pressure

Terrain	Deflection	Max. Speed	Load	Min Inflation
Highway	18%	149 km/h (93 mph)	1043 kg (2300 lbs)	2.76 Bar (40 PSI)
Cross Country	25%	48 km/h (30 mph)	1043 kg (2300 lbs)	1.60 Bar (23 PSI)
Mud, Sand, Snow	30%	16 km/h (10 mph)	1043 kg (2300 lbs)	1.24 Bar (18 PSI)

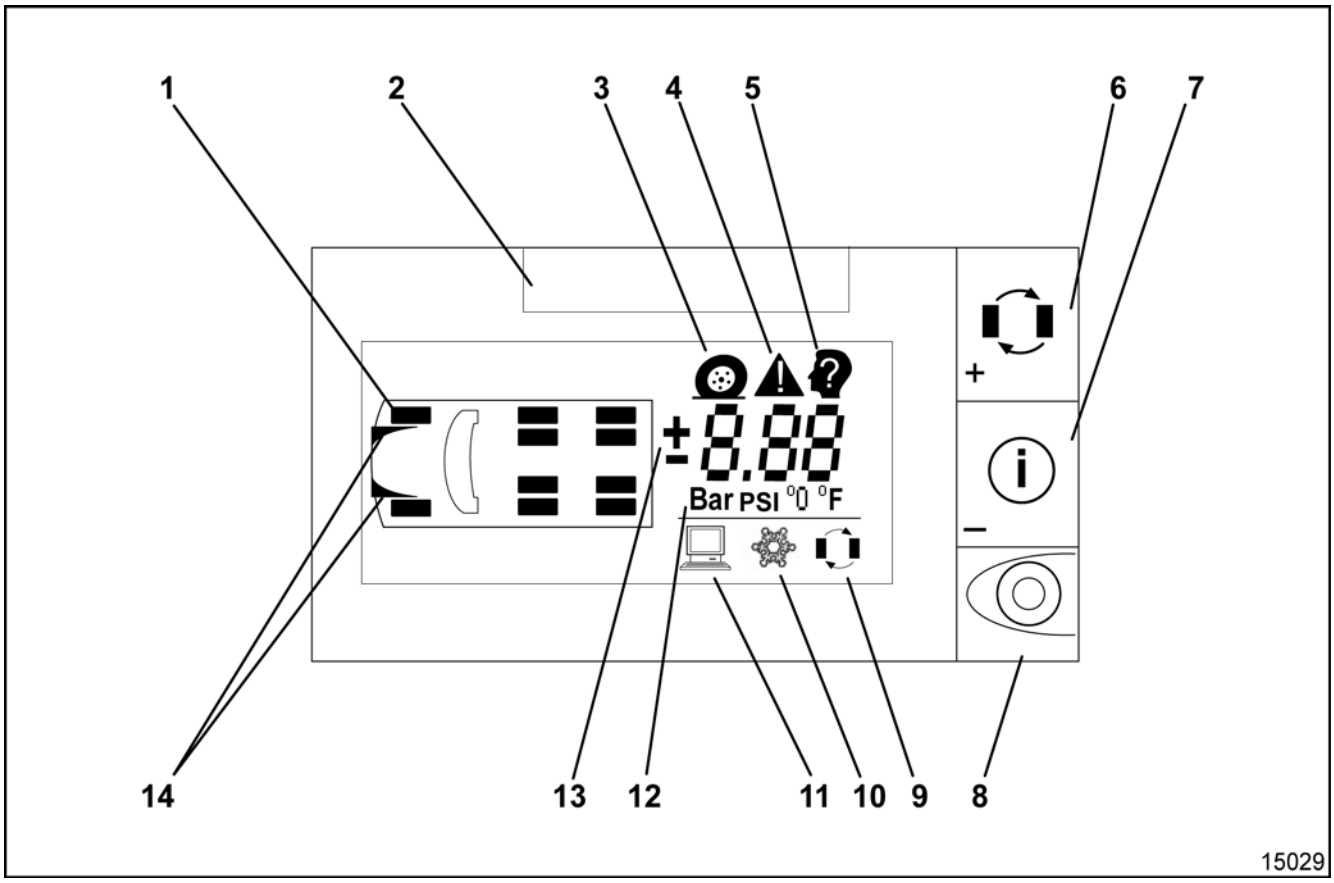
Schematic and Routing Diagrams

Tire Pressure Monitoring System


15085
Instrument Panel (I/P) Junction Block
F
C8
D
RED
BLK
2
1
Tire Monitor Receiver
TIRE PRESSURE
Message Display
Full Function Display
Receive Input
LF Tire Pressure Monitor Sensor
RF Tire Pressure Monitor Sensor
RR Tire Pressure Monitor Sensor
LR Tire Pressure Monitor Sensor
Solid State
+
-

Component Locator

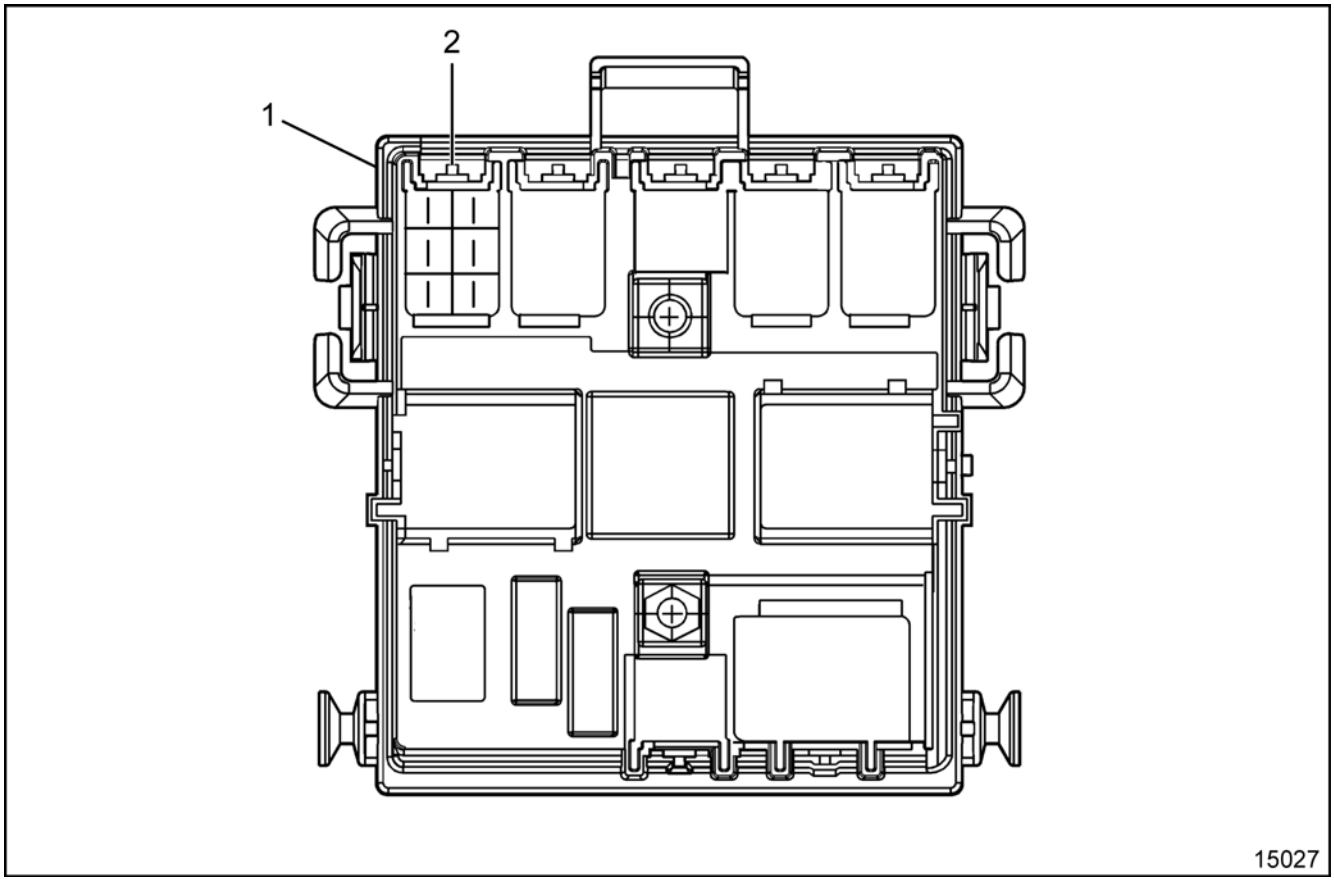
Function Display Unit



Legend

(1) Programmed Wheel Position
(2) Alarm Light
(3) Low Pressure Warning
(4) Alert Indicator
(5) Learn Mode
(6) TIRE Button
(7) MODE Button
(8) Set Button
(9) Tire Rotation Program
(10) Cold Pressure Program
(11) Programming Mode
(12) Units of Pressure or Temperature
(13) Numerical Display
(14) Towing Vehicle Indicator

Relay Block - IP



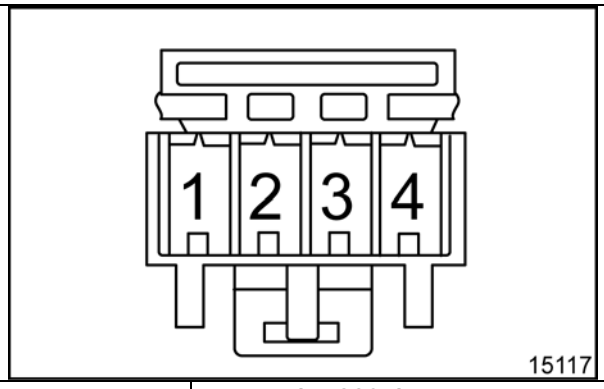
Legend

(1) Relay Block – IP

(2) C8 – Connector Location

Connector End Views

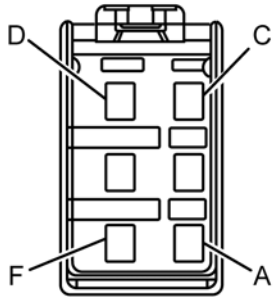
Receiver



Connector Part Information	• 174823-1 • 4-Way F

Pin	Wire Colour	Circuit No.	Function
1	RED	___	Battery Positive Voltage
2	BLK	___	Ground
3-4	___	___	Not Used

Relay Block - I/P C8



Connector Part Information	• 12193928 • 6-Way F Metri-Pack 280 Series Flexlock (CRM)

Pin	Wire Colour	Circuit No.	Function
A-C	___	___	Not Used
D	RED	___	Battery Positive Voltage
E	___	___	Not Used
F	BLK	___	Ground

Diagnostic Information and Procedures

Error Code E1

Condition for Setting the Error

This error may occur in certain vehicles where the receiver unit is powered even when the ignition is turned off. Other possible causes may be broken tire sensors or a malfunctioning Receiver unit. Mismatches in tire sensor ID may also cause this problem.

Error Code on Display	Component Failing	Fault	Action(s)
E1	Sensor(s) Receiver	Not Transmitting RF Section Malfunction	If no transmission received within 5 minutes of driving, contact dealer

Error Code E2

Conditions for Setting the Error

This error indicates that there is a problem with the data in the Receiver and/on Display units. Causes of this error can include:

- Corrupted custom profile
- Corrupted factory profile

The following may help identify the problem better.

Power the unit OFF and ON.

If the error has cleared → Operating with the incorrect settings. Contact dealer.

If error persists → Receiver (or Display) may have to be replaced.

Error Code on Display	Component Failing	Fault	Action(s)
E2	Receiver and/or Display	EEPROM Fault	Contact dealer

Error Code E3

Condition for Setting the Error

These errors will usually represent an internal fault. Try powering the unit OFF and ON to clear these errors. If these errors continuously occur the unit may have to be replaced.

Error Code on Display	Component Failing	Fault	Action(s)
E3	Receiver and/or Display	Oscillator Fault	Contact dealer

Error Code E4

Condition for Setting the Error

These errors will usually represent an internal fault. Try powering the unit OFF and ON to clear these errors. If these errors continuously occur the unit may have to be replaced.

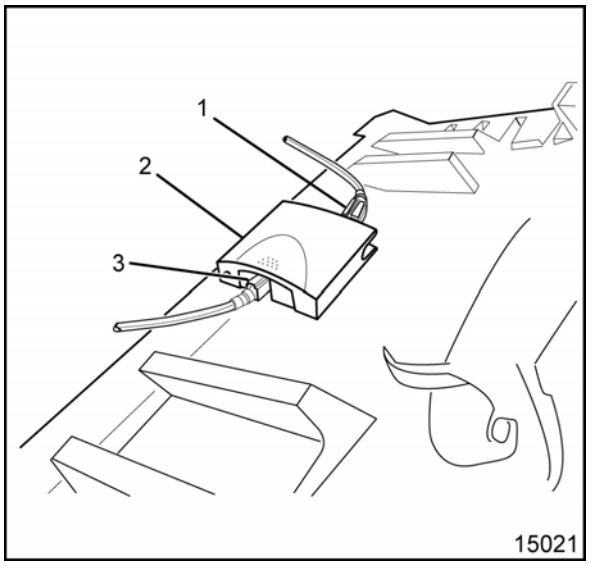
Error Code on Display	Component Failing	Fault	Action(s)
E4	Receiver and/or Display	Internal Bus Fault	Contact dealer

Repair Procedures

Receiver Replacement

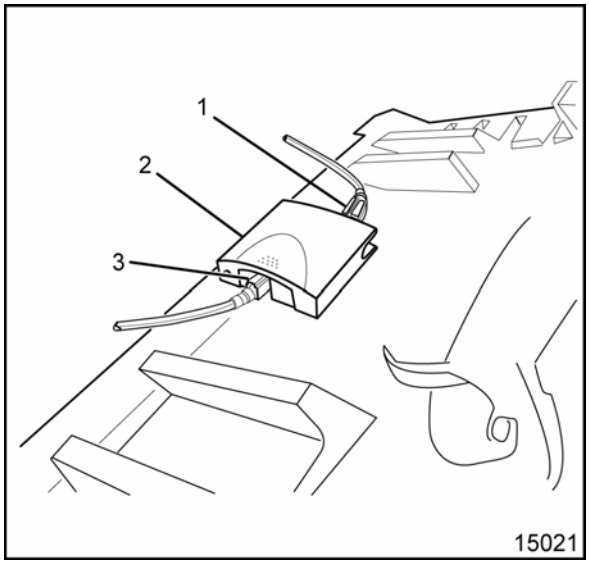
Removal Procedure

1. Remove the I/P Knee Bolster Panel.
2. Disconnect the power cable (3) from the receiver.
3. Disconnect the display cable (1) from the receiver.
4. Using a flat bladed tool carefully cut through the two-sided tape to release the receiver (2).



Installation Procedure

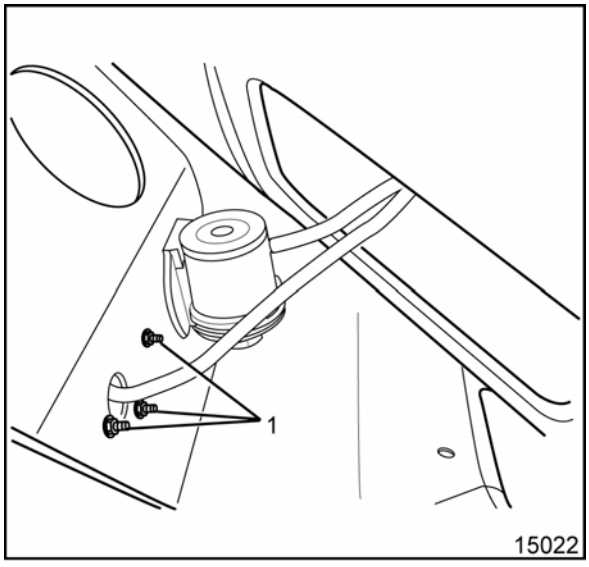
1. Clean off any two-sided tape remaining on the knee bolster panel.
2. Install the receiver (2) onto the panel in the same position as removed using two-sided tape.
3. Connect the display cable (1) into the receiver.
4. Connect the power cable (3) into the receiver.
5. Install the I/P knee bolster panel.

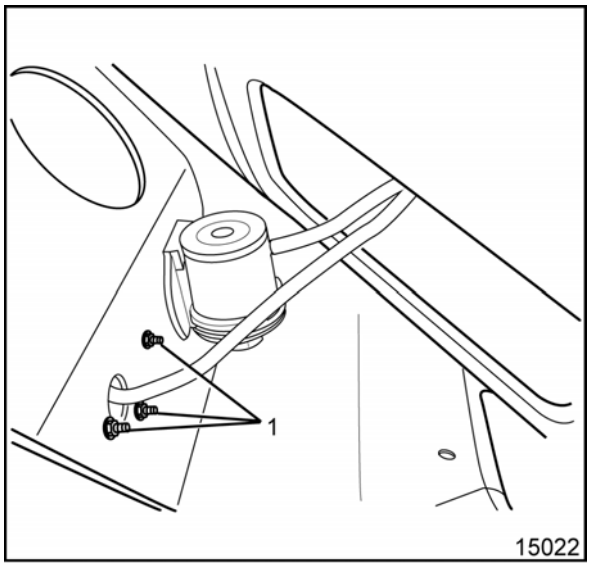


Monitor Display Replacement

Removal Procedure

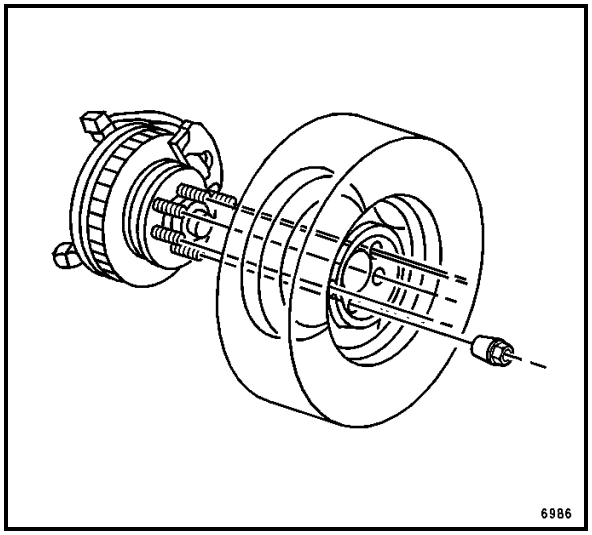
1. Remove the accessory panel. Refer to Accessory Panel Replacement in Instrument Panel, Gages and Console.
2. Remove the nuts (1) and washers.
3. Remove the display from the panel.
4. Remove the display cable from the receiver.





Installation Procedure

1. Route the display harness through the opening in the panel.
2. Install the display into the panel.
3. Install the washers and nuts (1).
4. Install the accessory panel. Refer to Accessory Panel Replacement in Instrument Panel, Gages and Console.
5. Install the display cable into the receiver.

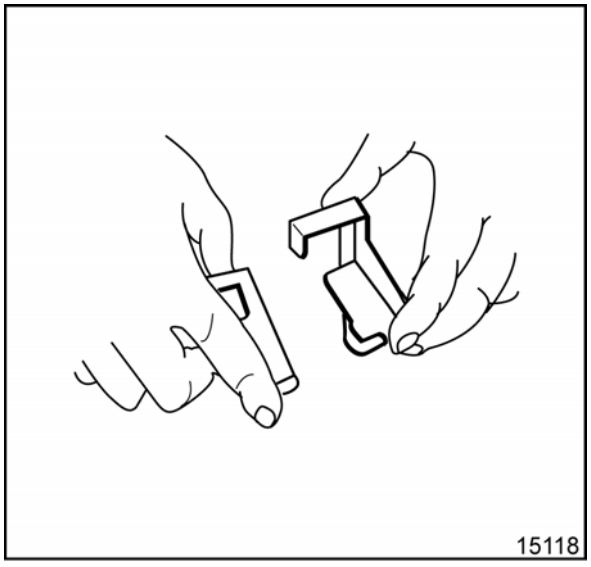


Pressure Transmitter Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

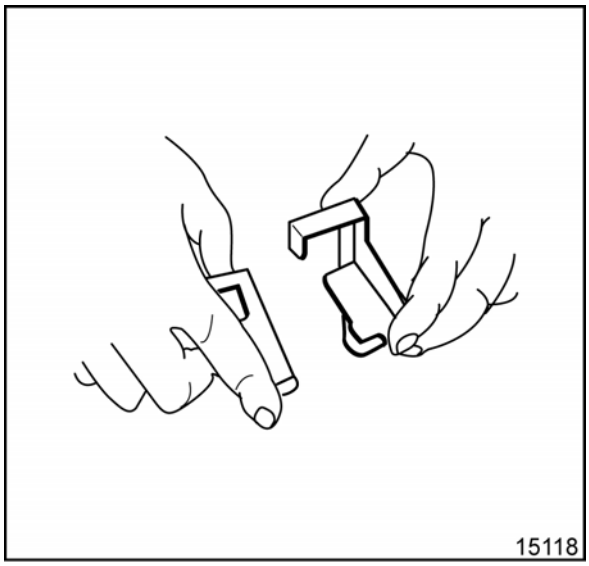
1. Raise and support the vehicle.
2. Remove the affected wheel. Refer to Tire and Wheel Removal and Installation in the C/K Truck Service Manual.
3. Remove the pressure transmitter sensor assembly. Refer to Tire Mounting and Dismounting Procedure in Tires and Wheels.



4. Separate the transmitter sensor from the bracket.
5. Inspect all parts and replace as needed.

Installation Procedure

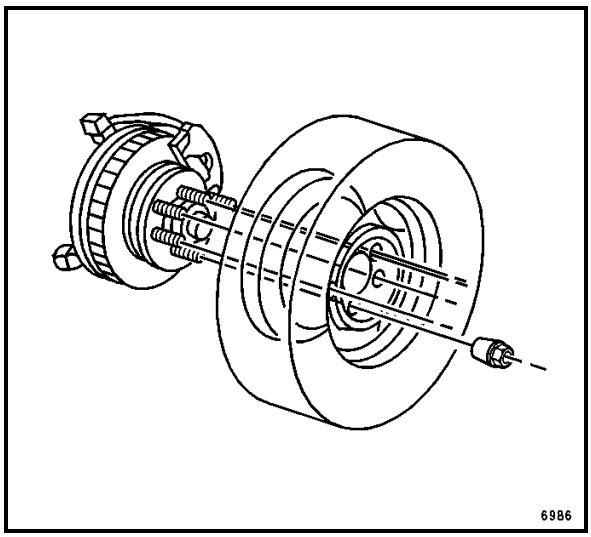
1. Install the transmitter sensor into the bracket.



2. Install the pressure transmitter sensor assembly. Refer to Tire Mounting and Dismounting Procedure in Tires and Wheels.

Notice: Refer to Fastener Notice in Cautions and Notices.

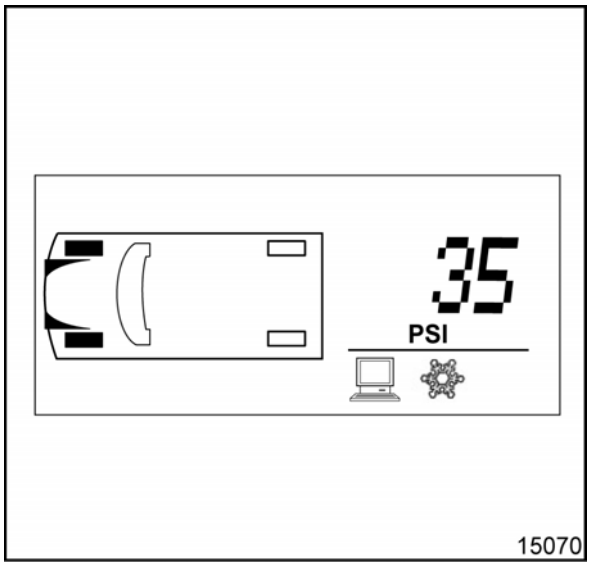
3. Install the tire. Refer to Tire and Wheel Removal and Installation in the C/K Truck Service Manual.
4. Remove the supports and lower the vehicle.
5. Program the system. Refer to Tire Pressure Monitoring Programming.



Tire Pressure Monitoring Programming

Entering Programming Modes

1. Ensure the power is turned on.
2. Press and hold set button in normal mode to enter programming modes.
   - 2 seconds to Level 1
   - 5 seconds for Level 2



Level 1

Cold Inflation Pressure

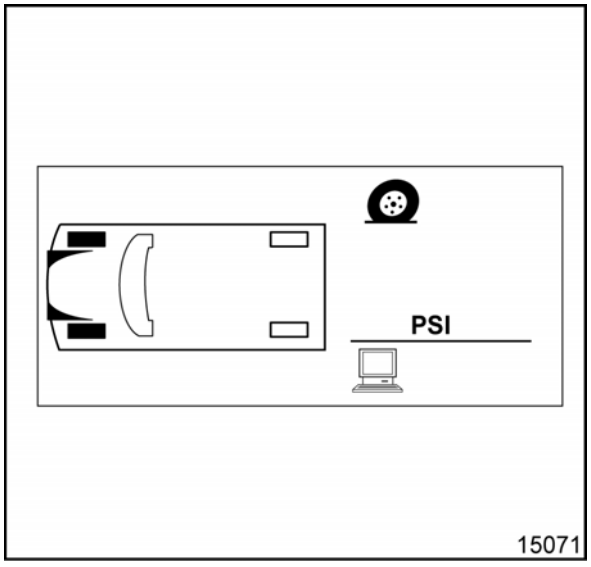
Note: This function changes the cold inflation pressure for each axle.

Factory default 2.08 Bar (30 PSI).

1. Enter Level 1 Programming Mode.
2. Press the TIRE button to scroll to the desired axle. The tires of the selected axle are filled in.
3. Press the MODE button to view the current value.
4. Press the TIRE button to increase the value.
5. Press the MODE button to decrease the value.
6. Press the SET button to save when the desired value is reached.

Note: Repeat programming steps 2-6 until Cold Inflation Pressure levels are set for all axles as desired.

7. Press the SET button to exit.
8. Press the SET button again to revert to normal view.



Low Pressure Warning

Note: This function changes to low-pressure warning threshold for each axle.

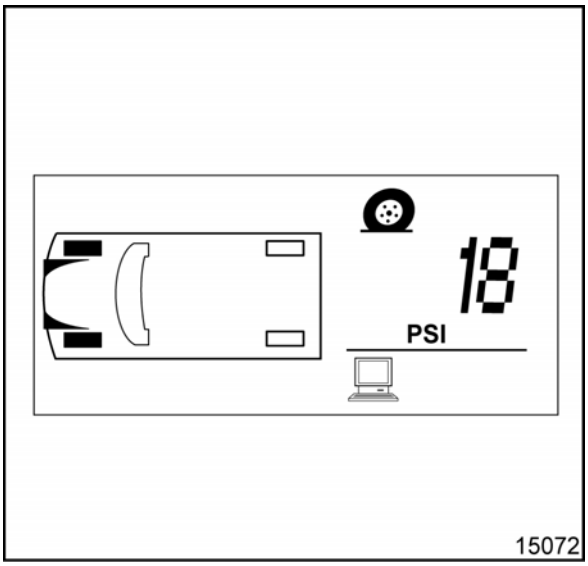
Factory default 1.25 Bar (18 PSI).

1. Enter Level 1 Programming Mode.
2. To enter this function press the MODE button until the flat tire icon and pressure units are displayed.
3. Press the TIRE button to scroll to the desired axle. The tires of the selected axle are filled in.

4. Press the MODE button to view the current value.
5. Press the TIRE button to increase the value.
6. Press the MODE button to decrease the value.
7. Press the SET button to save when the desired value is reached.

Note: Repeat programming steps 2-7 until Low-Pressure warning levels are set for all axles as desired.

8. Press the SET button to exit.
9. Press the SET button again to revert to normal view.

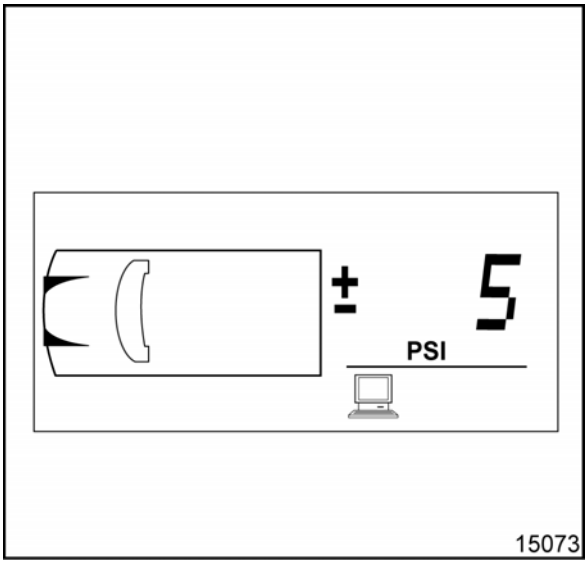


Pressure Deviation Alert

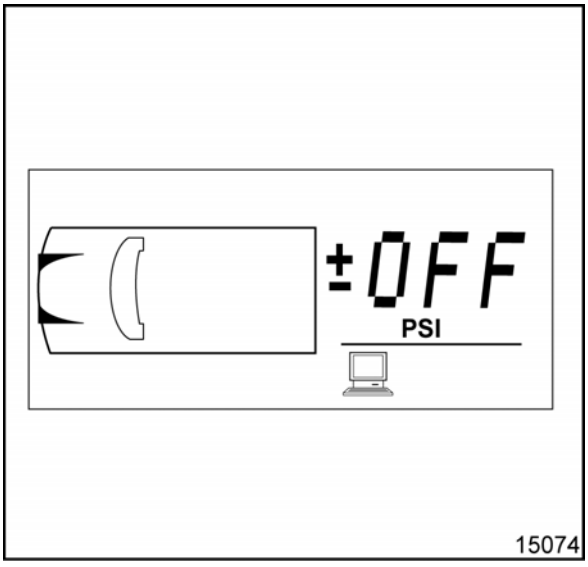
Note: This function sets the pressure deviation alert threshold for all tires.

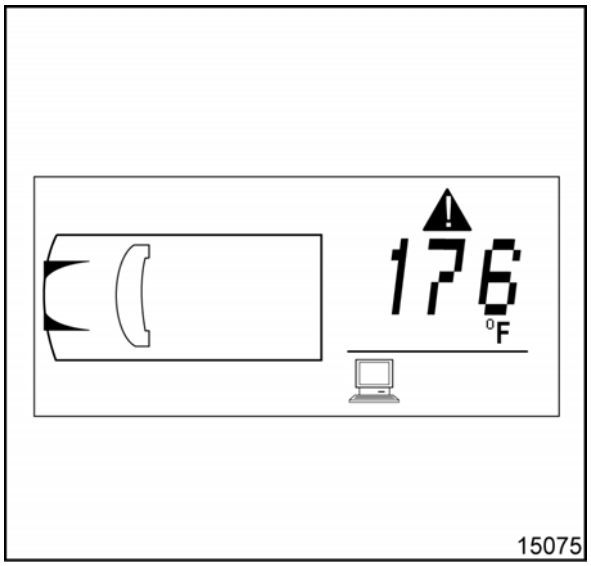
Factory Default 35 Bar (5 PSI).

1. Enter Level 1 Programming Mode.
2. To enter this function press the MODE button until the + - icon and pressure units are displayed.
3. Press the TIRE button to enter and display the current value.
4. Press the TIRE button to increase the value.
5. Press the MODE button to decrease the value.



6. Press the MODE button until the display shows OFF to disable this feature.
7. Press the SET button to save when the desired value is reached.
8. Press the SET button again to revert to normal view.



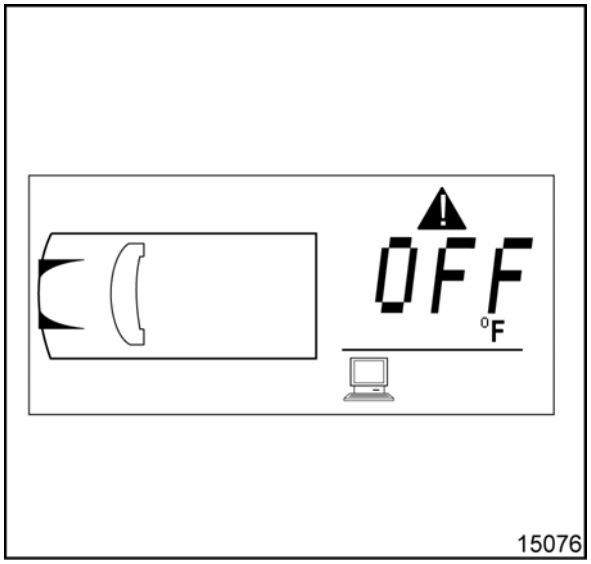


High Temperature Alert

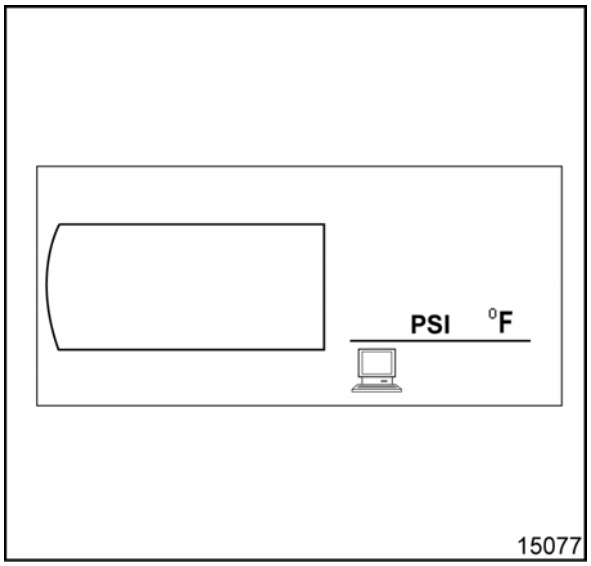
Note: This function changes the high-temperature alert threshold.

Factory Default 80°C (176°F).

1. Enter Level 1 Programming Mode.
2. To enter, press the MODE button until the alert icon and temperature until are displayed.
3. Press the TIRE button to enter and display the current value of High Temperature Alert.
4. Press the TIRE button to increase the value.
5. Press the MODE button to decrease the value.



6. To disable this feature press the MODE button until the display reads OFF.
7. Press the SET button to save and exit this mode when the desired value is reached.
8. Press the SET button again to revert to normal mode.



Metric or Imperial Measurement Selection

Note: Use this mode to select the combination of pressure and temperature units.

Unit Combinations

Bar - °C, Bar - °F, PSI - °C, PSI - °F.

Programming Steps

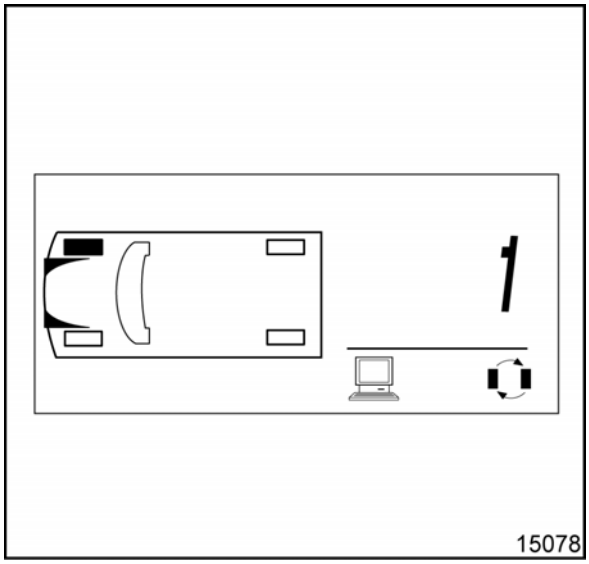
1. Enter Level 1 Programming Mode.
2. To enter this function press the MODE button until the pressure and temperature units are displayed (PSI/Bar, °C/°F).
3. Press the TIRE button to enter.
4. Use the TIRE or MODE button to scroll through the four combinations of the unit settings.
5. When the desired combination is displayed press the SET button to save and exit this mode.
6. Press the SET button again to revert to normal mode.

Tire Rotation

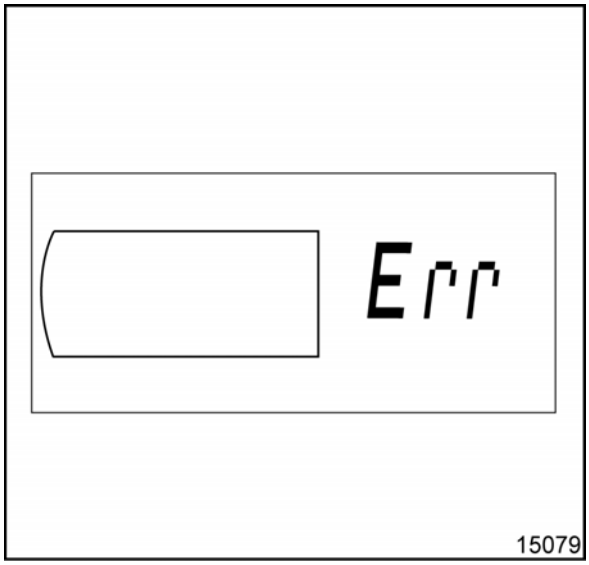
Note: This function is used after the tires are rotated and the new position needs to be updated. This procedure is valid for four tire locations only.

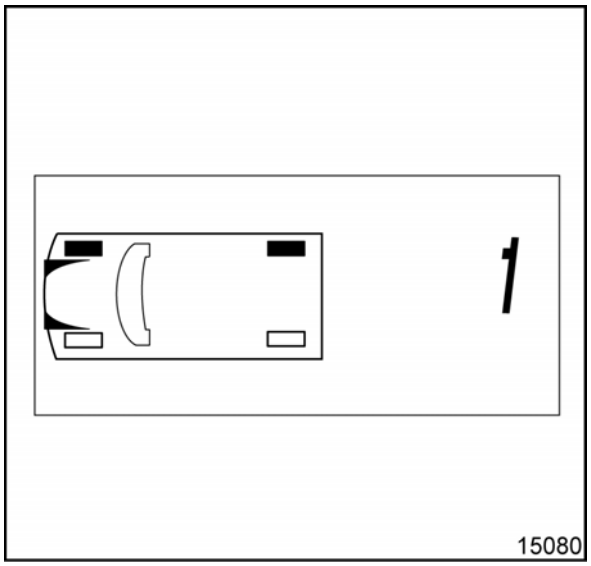
1. Enter Level 1 Programming Mode.
2. To enter, press the MODE button until the tire rotation icon is displayed.
3. Press the TIRE button to scroll to a tire position.
4. Press the MODE button to select it for editing.
5. Note the color of the washer on the physical tire at the currently selected position.

6. Use the transmitter location specifications chart in Description and Operation to determine the number corresponding to color noted in step 5.
7. Use the TIRE or MODE button to adjust the value to the number determined in step 6.
8. Press the SET button when the number representing the desired sensor is achieved. This returns the display to the tire selection menu. Scroll to a different tire location and edit the sensor numbers as above.
9. Press the SET button to save and exit this mode.

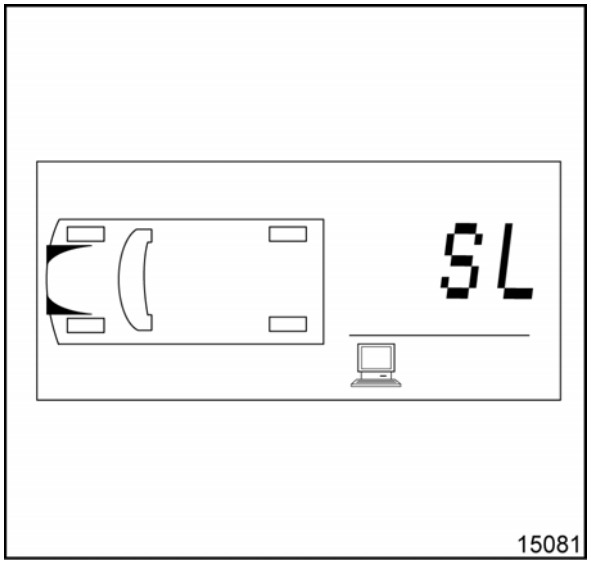


If more than one tire location contain the same sensor number, the display will prompt an error with the conflicting tires filled in and the associated sensor number. Press any button to return the tire selection menu and make necessary corrections.





10. Press the SET button again to revert to normal mode.



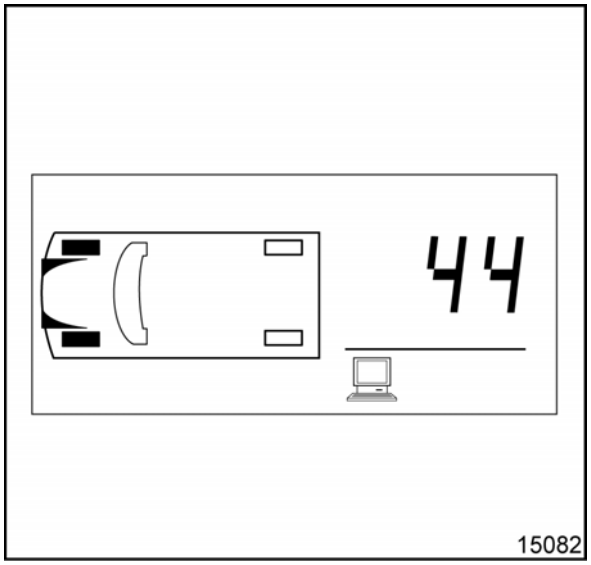
Level 2

Slope

Refer to the Tire Pressure Monitoring System Setting chart in Specifications.

Notice: Factory Default 44. The slope is a value corresponding to the rate of pressure change due to temperature for a particular tire. This value affects the calculation to determine pressure deviation value.

1. Enter Level 2 Programming Mode
2. Press the TIRE button to scroll to the desired axle, the tires of the selected axle are filled in.
3. Press the MODE button to display the current value of slope for the selected axle.



4. Press the TIRE button to increase the value.
5. Press the MODE button to decrease the value. The minimum value is 10 and the maximum is 160.
6. Press the SET button to save the value.

Note: Repeat steps 2-6 until the slope level is set for all axles desired.

7. Press the SET button to exit.
8. Press the SET button again to revert to normal mode.

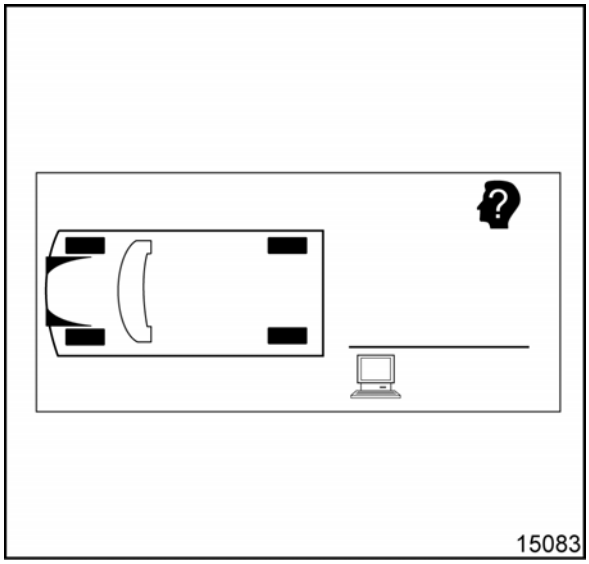
Learn

Note: This mode is used to add or remove transmitters from the system.

Learn Procedure W/O Special Tool

1. Enter Level 2 Programming Mode.
2. Press the MODE button to select the learn mode icon.
3. Press the TIRE button to display the ten possible wheel positions for the towing vehicle. The currently installed transmitter positions are now indicated with a filled in tire indicator.
4. Use the TIRE button to scroll to the desired position. The outline of the wheel position to be programmed will flash.

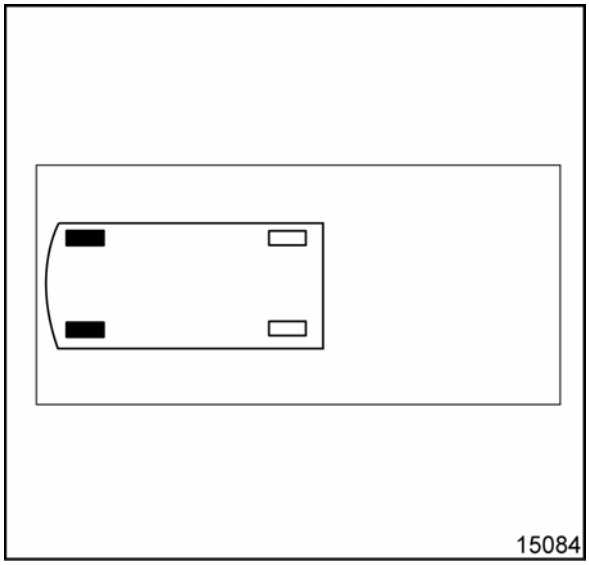
5. A new transmitter identification can be learned in two ways:
   - Vigorously shake the transmitter to provoke a transmission.
   - By inflating or deflating the tire by more than 0.2 Bar (3 PSI).

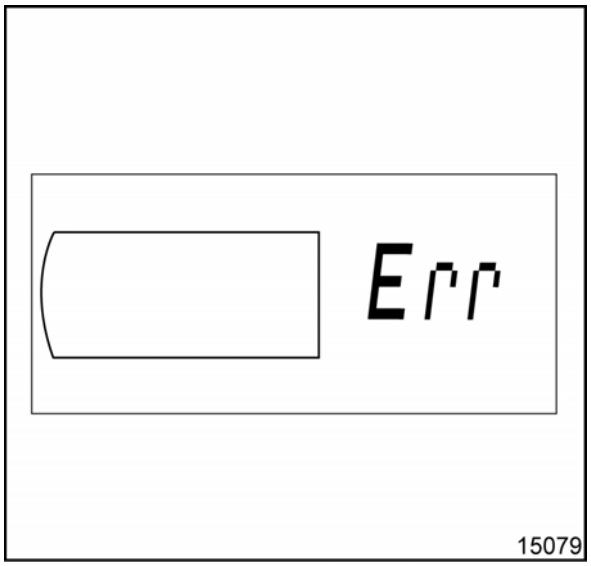


Notice: This method must be carried out while the transmitters are in “gauge fill” mode. This mode is entered for 15 minutes after the vehicle has been driven above 10 kph (6 mph). Each transmitter “learn operation” must be carried out at least 90 seconds apart. If it is not possible to complete the learn operation for all transmitters within 15 minutes, the vehicle must again be driven above 10 kph (6 mph) and then the process can be continued.

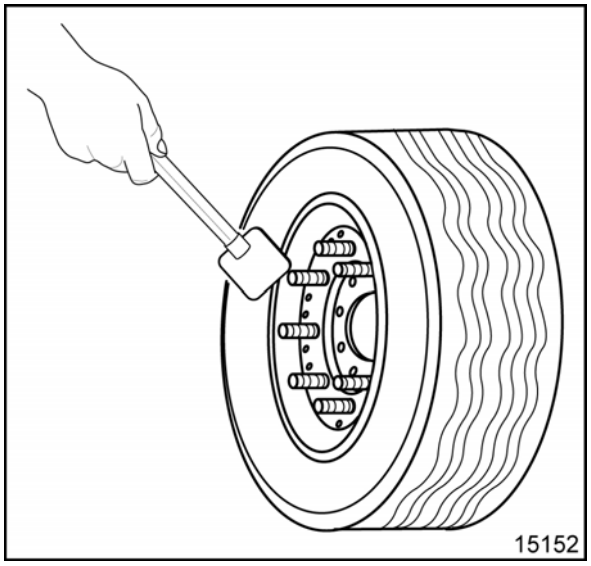
Note: To prevent the last identification being erased, scroll to the next tire position before driving. A beep and rapid flashing of the alarm light indicate a transmission was received. The new ID is stored.

6. To remove the transmitter from the selected tire location, press the MODE button.
7. Press the TIRE button to scroll to another position and repeat step 4 or 5 as required.
8. Press the SET button to save and exit.





Notice: If no error is found, the system will reset and go to normal mode. If more than one tire location contains the same sensor ID, the display will prompt an error and flash between this message and the display, with the conflicting tires filled in. If so indicated repeat the programming procedure above.



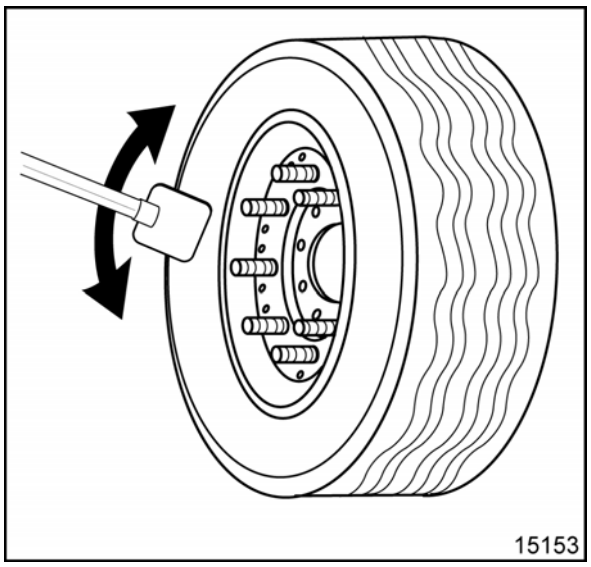
Learn Procedure With Special Tool

Tools Required

200.0125 LF Interrogator Wand

Note: The SmarTire receiver that is installed on the vehicle needs to have the unique sensor identification code for each wheel position programmed into it to ensure proper operation of the system. Each wheel assembly has a sensor in it that can be activated using the LF wand (1) that has been supplied for this purpose. When the sensor is activated, it sends out its unique identification code which is then stored in the memory of the receiver so that it knows which sensors belong to that vehicle.

The vehicle does not have to be moving to accomplish this task, which allows programming of receivers to be carried out very easily. To use the wand to activate the sensor, press the button on the side of the wand (a small red LED will illuminate to show it is working, if this does not happen the replace the batteries) and place the square head of the wand, flat against the tire sidewall. The wand can activate the sensor within a 60-degree arc of the sensor on the rim.

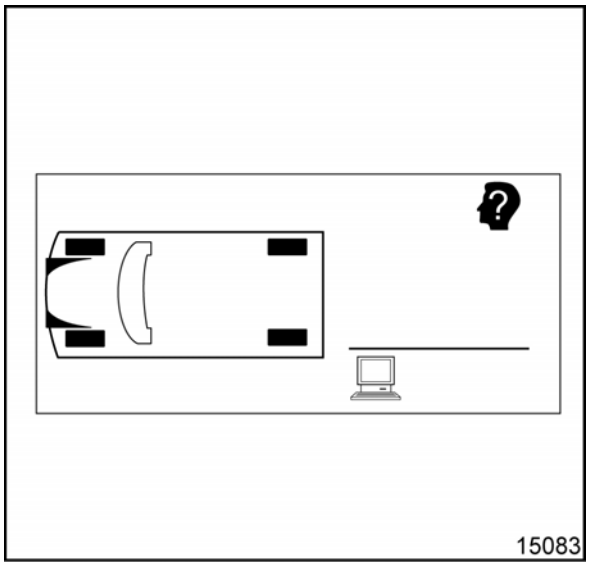


If the location of the sensor is not known, the wand can be slowly moved around the circumference of the tire until the sensor is activated.

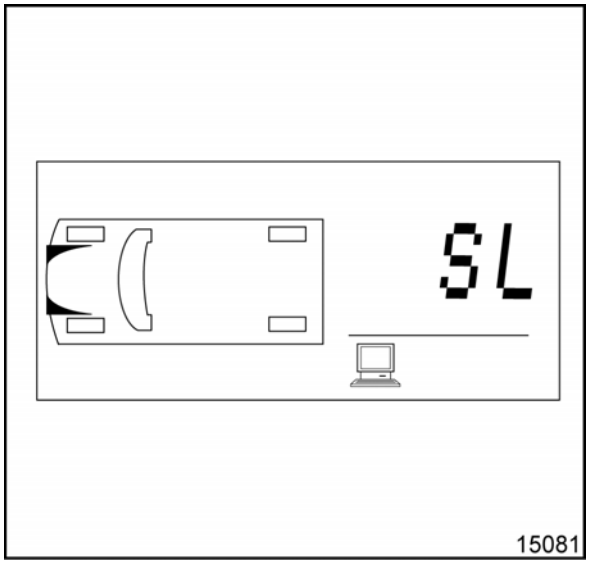
The “Learn” operation is carried out by using the Full Function Display that is already installed in each vehicle.

Programming Procedure

1. Enter Level 2 Programming Mode of the Full Function Display by pressing the SET button for 5 seconds until SL can be seen in the display.
2. Press the MODE button to select learn mode, which is indicated by a head with a question mark icon.
3. Press the TIRE button to display the ten possible wheel positions for the towing vehicle (a windshield can also be seen to indicate that the towing vehicle is selected).
4. The outline of the Front Right tire will be flashing.
5. Use the LF wand to activate the sensor from the Front Right tire.

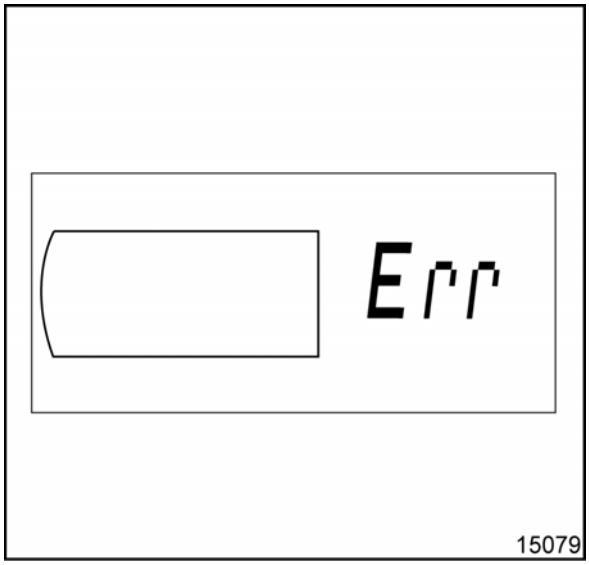


6. When the sensor is activated and the “Learn” operation is successful, the outline of the tire is filled in and the receiver will issue a chirping sound. The red LED on the FFD will also light up.
7. Press the TIRE button to move to the Front Left tire and activate the sensor in this position.
8. Press the TIRE button (5 times) to move to the Rear Right tire and activate the sensor in this position.
9. Press the TIRE button to move to the Rear Left tire and activate the sensor in this position.
10. Once all 4 positions have been “Learn”, press the SET button to store the information. The FFD will blink and the receiver will issue an audible tone to signify success.



11. If more than one tire location contains the same sensor ID, the display will prompt an error and flash between this message and the display, with the conflicting tires filled in. If this happens, press the Tire button and the display will show the positions with the same ID’s. Use the MODE button to delete the sensor that is incorrect and the carry out the “Learn” operation for that position.

Notice: If a sensor is programmed into an incorrect position on the vehicle during the Learn process, it can be deleted by scrolling to the incorrect (using the TIRE button) and pressing the MODE button. Once the Learn operation is completed as above, to double check the sensors are in the correct position, walk around the vehicle and activate each sensor with the wand. The display should show all 4-wheel positions as expected.

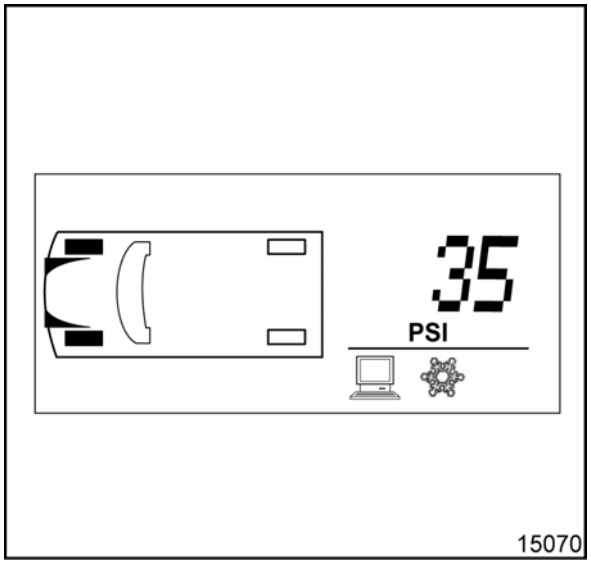


Changing Cold Inflation Pressure and Low Pressure Warning Settings

Note: The default settings for the Tire Pressure Monitoring system supplied with this vehicle are:

- Cold Inflation Pressure is 3 Bar (45 PSI) Front Axle, 4 Bar (60 PSI) Rear Axle
- Deviation Alert (First Warning) is 34 Bar (5 PSI) all wheels (This does not need to be changed)
- Low Pressure Warning (Second Warning) is 2.28 Bar (33 PSI) Front Axle, 3 Bar (45 PSI) Rear Axle.

If it is necessary to change these settings because the vehicles tire pressure settings are changed, follow the below instructions to accomplish this change. Use the same instructions to change the system back to the original settings above, when required.



To Change the Cold Inflation Pressure settings for each axle

1. Enter Level 1 Programming Mode by pressing the SET button for 2 seconds.
2. Press the TIRE button to scroll to the desired axle. The tires of the selected axle are filled in.
3. Press the MODE button to view the current value.
4. Press the TIRE button to increase the value.
5. Press the MODE button to decrease the value.
6. Press the SET button to save when the desired value is reached.

Note: Repeat programming steps 2-6 until Cold Inflation Pressure levels are set for all axles as desired.

7. Press the SET button to exit.

To Change the Low Pressure Warning setting for each axle

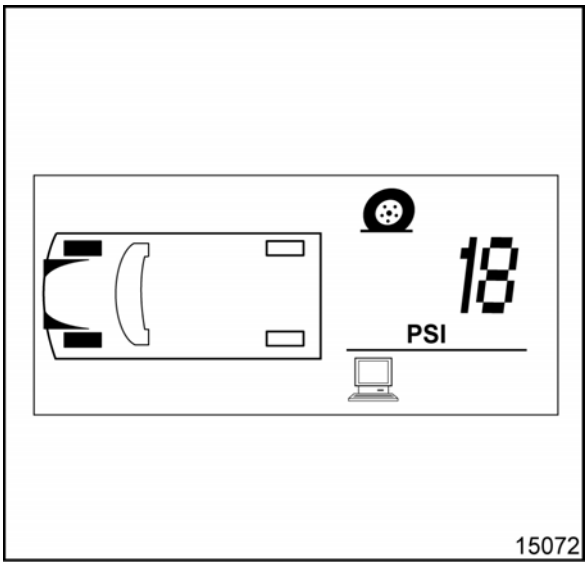
Refer to the Tire Pressure Chart in Specifications.

1. Enter Level 1 Programming Mode by pressing the SET button for 2 seconds.
2. To enter this function press the MODE button until the flat tire icon and pressure units are displayed.
3. Press the TIRE button to scroll to the desired axle. The tires of the selected axle are filled in.
4. Press the MODE button to view the current value.
5. Press the TIRE button to increase the value.
6. Press the MODE button to decrease the value.

7. Press the SET button to save when the desired value is reached.

Note: Repeat programming steps 3-7 until Low-Pressure Warning levels are set for all axles as desired.

8. Press the SET button to exit.



Description and Operation

General Description – Tire Pressure Monitoring

The system is a sensing device designated to identify and display tire operating data and activate an alert or warning when tire pressure or temperature irregularities are detected.

Tire Monitoring

The system consists of wheel mounted sensor/transmitters inside each tire which measure contained air pressure and temperature then transmit this data to a receiver within view of the driver.

System Operation

The system operates continuously, transmitting air pressure and temperature data.

- At approximately 5-minute intervals when the vehicle is moving faster than 10 kph (6 mph) unless pressure changes, then data is transmitted within 7 seconds.
- Every 15 minutes when the vehicle is parked and pressure drops to 124 Kpa (18 PSI) or lower.

Note: Each color on front indicator panel refers to a Transmitter with a corresponding washer color on the valve stem. Color washer must stay with the corresponding color Transmitter during tire rotation.

Transmitter Location

Transmitter	Wheel Position
Green	Right Front
Red	Left Front
Blue	Right Rear
Yellow	Left Rear

Important: Use of Chemicals. Temporary resealing or reinflation products containing internal sealers or propellants in any tire/wheel assembly may adversely affect the operation of the Sensor/Transmitters.

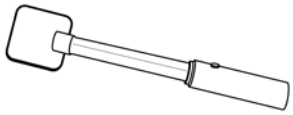
Understanding Temperature Compensated Pressure Readings

An important feature of the SmarTire Full Function Display system is that pressure deviation alerts are initiated from a comparison of the temperature compensated pressure to the measured tire pressure read by the sensor.

The reference pressure, or “cold pressure” is the air pressure inside the tire inflated at room temperature 18°C (64°F) to the vehicle manufacture’s recommendation. When a tire heats up, the air pressure inside the tire can also be expected to increase. For example, a normal or “required” pressure at 64°F or 18°C may be 2.35 Bar (34 PSI) and a normal pressure at 49°C (120°F) may be 2.7 Bar (39 PSI). Both pressure readings are correct at their respective temperatures.

The amount of deviation from the required pressure (at any temperatures) can be read by using the Pressure Deviation mode of this SmarTire product. If at any time you are uncertain that the Actual Pressure reading on the display indicates the correct tire pressure, switch to the Pressure Deviation (+-) readout. A blank display indicates that the reading on the display is the correct one. Any (+) or (-) value indicates the tire pressure is incorrect by that value. This value can then be used to correctly inflate the tire.

Special Tools and Equipment

Illustration	Tool Number/Description
 15154	200.0125 LF Interrogator Wand

BLANK

Section 4

Driveline/Axle

Front Drive Axle 4-3
Repair Instructions 4-3
Front Axle Vent Tube Filter Replacement 4-3
Description and Operation 4-4
Front Axle Vent Tube Filter Description 4-4
Rear Drive Axle 4-5
Repair Instructions 4-5
Rear Axle Vent Tube Filter Replacement 4-5
Description and Operation 4-6
Rear Axle Vent Tube Filter Description 4-6
Transfer Case 4-7
Repair Instructions 4-7
Transfer Case Vent Tube Filter Replacement ... 4-7
Description and Operation 4-8
Transfer Case Vent Tube Filter Description 4-8

BLANK

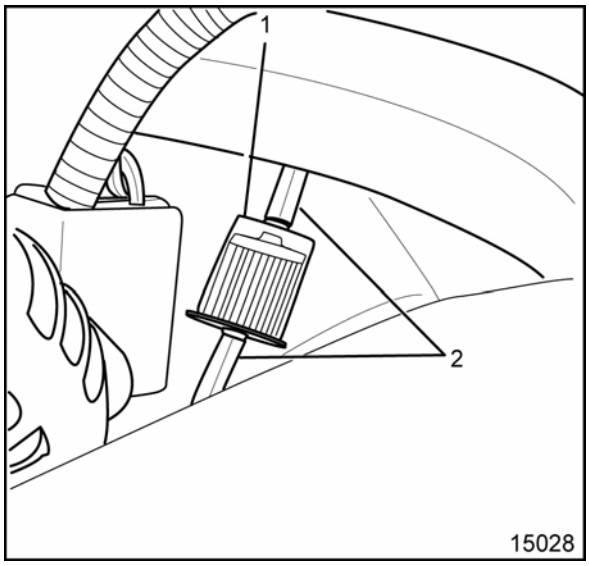
Front Drive Axle

Repair Instructions

Front Axle Vent Tube Filter Replacement

Removal Procedure

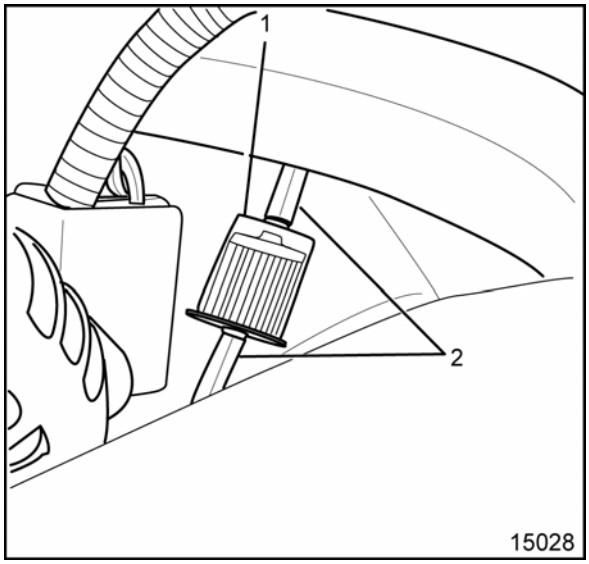
1. Remove the hoses (2) from the filter (1).
2. Remove the filter (1) and discard.
3. Inspect the hoses and reducers for damage or wear. Replace as needed. If replacing the hose, the length of the new hose must match the length of the old hose.



Installation Procedure

Notice: The filter arrow must point toward the axle vent pipe.

1. Install the filter (1) by pushing on the hoses (2).



Description and Operation

Front Axle Vent Tube Filter Description

The front axle is specially equipped with a vent tube filter to protect the axle from contaminants found in the off-road environment. The vent filter is attached to a hose with a vented cap at the end, and is mounted in the engine compartment next to the left inner wheel housing.

The filter must be inspected occasionally to see if it needs to be replaced. Refer to Periodic Maintenance Inspections in Maintenance and Lubrication in the Enhanced Mobility Package Owner's Manual Supplement.

Rear Drive Axle

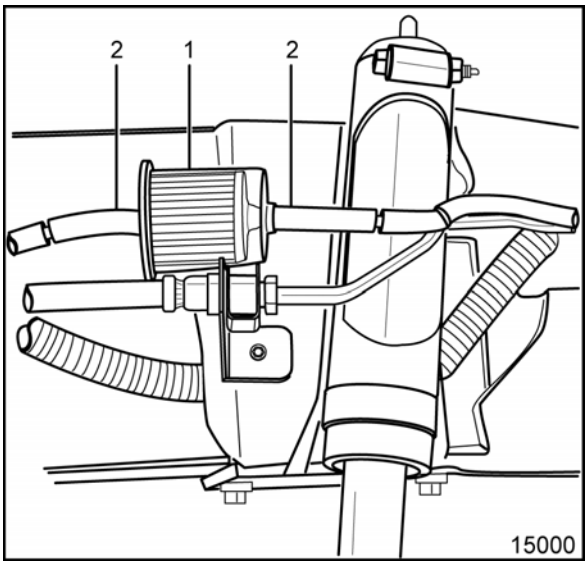
Repair Instructions

Rear Axle Vent Tube Filter Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

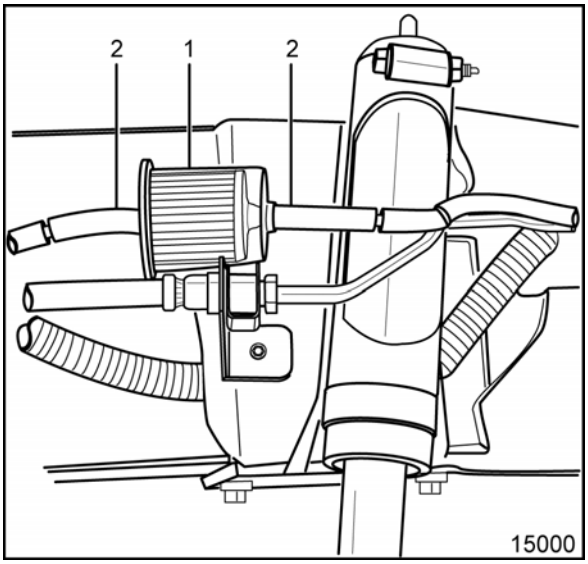
1. Raise and support the vehicle.
2. Remove the hoses (2) from the filter (1).
3. Remove the filter and discard.
4. Inspect the hoses and reducers for damage or wear. Replace as needed. If replacing the hose, the length of the new hose must match the length of the old hose.



Installation Procedure

Notice: The filter arrow must point toward the axle vent pipe.

1. Install the filter (1) by pushing on the hoses (2).
2. Remove safety stands.
3. Lower the vehicle.



Description and Operation

Rear Axle Vent Tube Filter Description

The rear axle is specially equipped with a vent tube filter to protect the axle from contaminants found in the off-road environment. It is attached to a hose with a vented cap at the end. The rear axle vent filter is mounted near the jounce bumper and the brake bracket on the driver's side frame rail.

The filter must be inspected occasionally to see if it needs to be replaced. Refer to Periodic Maintenance Inspections in Maintenance and Lubrication in the Enhanced Mobility Package Owner's Manual Supplement.

Transfer Case

Repair Instructions

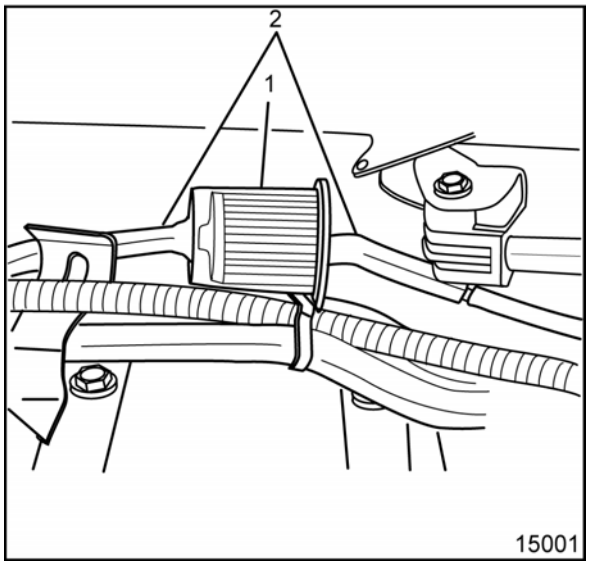
Transfer Case Vent Tube Filter Replacement

Removal Procedure

Note: The filter is located on the left side of the vehicle.

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

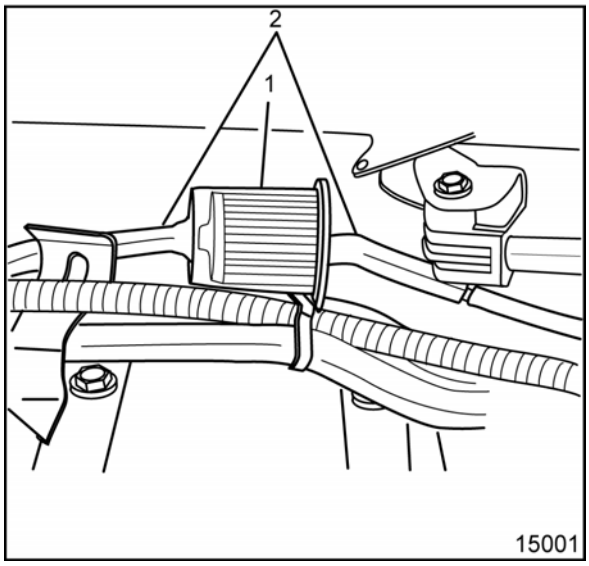
1. Raise and support the vehicle.
2. Remove the hoses (2) holding the filter (1).
3. Remove the filter and discard.
4. Inspect the hoses and reducers for damage or wear. Replace as needed. If replacing the hose, the length of the new hose must match the length of the old hose.



Installation Procedure

Notice: The filter arrow must point toward the transfer case.

1. Install the filter (1) by pushing on the hoses (2).
2. Remove safety stands.
3. Lower the vehicle.



Description and Operation

Transfer Case Vent Tube Filter Description

The vehicles feature a two-speed transfer case. A vent tube is mounted between the transmission and transfer case, which attaches to a hose, filter and vent cap. The filter must be inspected occasionally to see if it needs to be replaced. Refer to Periodic Maintenance Inspections in Maintenance and Lubrication in the Enhanced Mobility Package Owner's Manual Supplement.

Section 6

Engine

Engine Electrical.....6-3
Specifications.....6-3
Repair Instructions.....6-4
Battery Reinforcement Bracket Replacement 6-4
Engine Controls.....6-5
Specifications.....6-5
Repair Procedures.....6-6
Air Flow Meter Replacement 6-6
Air Flow Meter Hose Replacement 6-6
Air Flow Adapter Replacement 6-9
Engine Control Module (ECM) Replacement..... 6-9
Description and Operation..... 6-10
Air Filter Restriction Indicator..... 6-10
Engine Control Module (ECM)..... 6-10

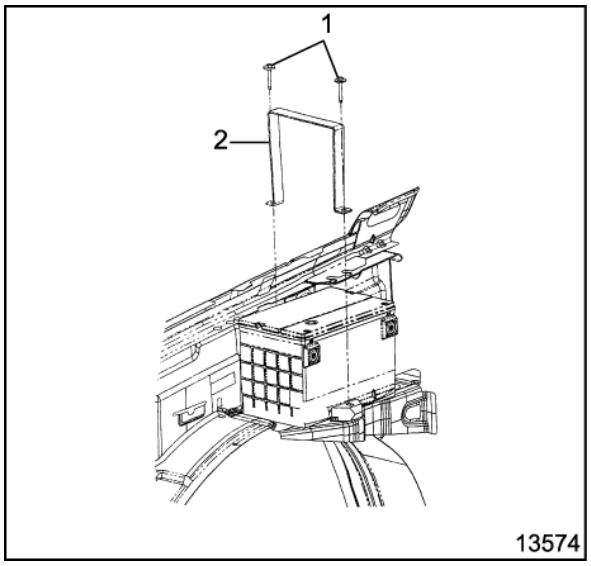
BLANK

Engine Electrical

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Battery Retainer Bolts	9 N•m	7 lb ft

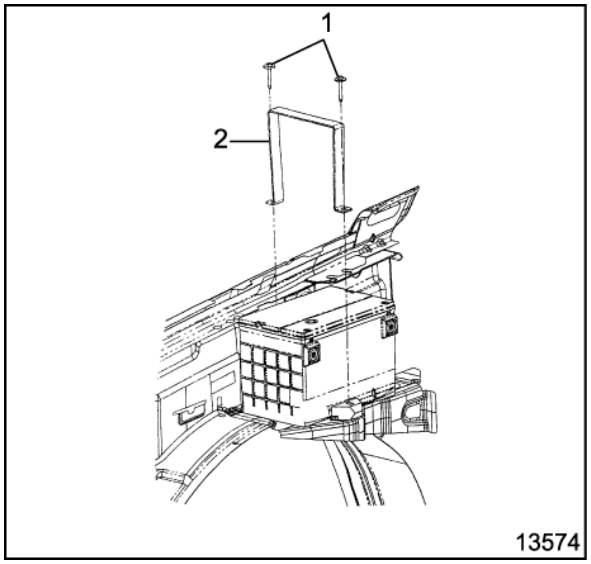


Repair Instructions

Battery Reinforcement Bracket Replacement

Removal Procedure

1. Remove the bracket bolts (1).
2. Remove the bracket (2) from the battery.



Installation Procedure

1. Install the bracket (2) onto the battery.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolts (1) and tighten.
   Tighten
   Tighten bracket bolts to 9 N•m (7 lb ft).

Engine Controls

Specifications

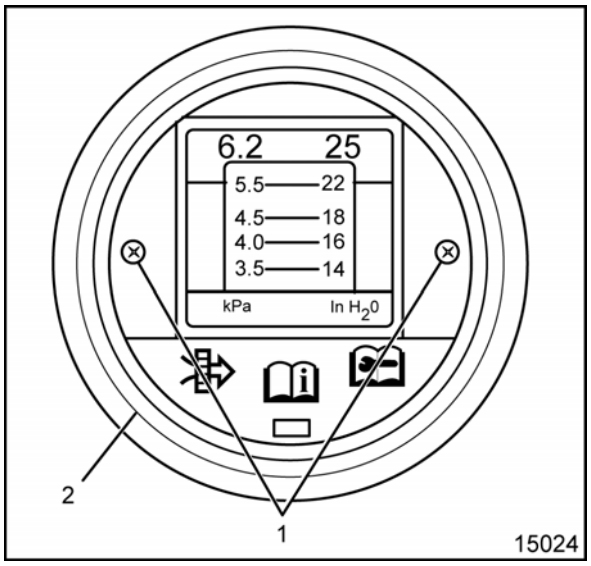
Fastener Tightening Specifications

Application	Specification	
	Metric	English
Accessory Panel Bolts	2.0 N•m	18 lb in

ECM Calibration

Model Year	Engine	Transmission	New Tire Size	*Calibration P/N
2003/2004	LB7	M74	LT285/75R18 (628 Rev/Mile) (392 Rev per Kilometer)	15130245
2004	LLY	M74	LT285/75R18 (628 Rev/Mile) (392 Rev per Kilometer)	15130246
2005	LLY	M74	LT285/75R18 (628 Rev/Mile) (392 Rev per Kilometer)	15130247
Please refer to the light duty series GM BODY BUILDER BOOK for further general information regarding vehicle modification.				

* New calibrations include maximum vehicle speed of 93 mph (150 km/h).

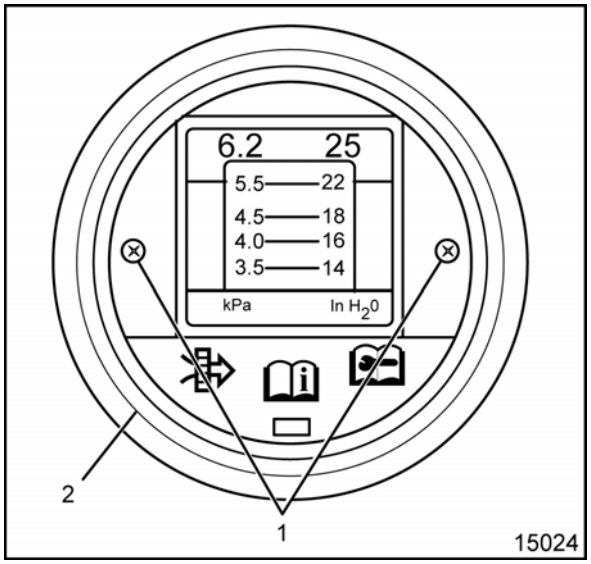


Repair Procedures

Air Flow Meter Replacement

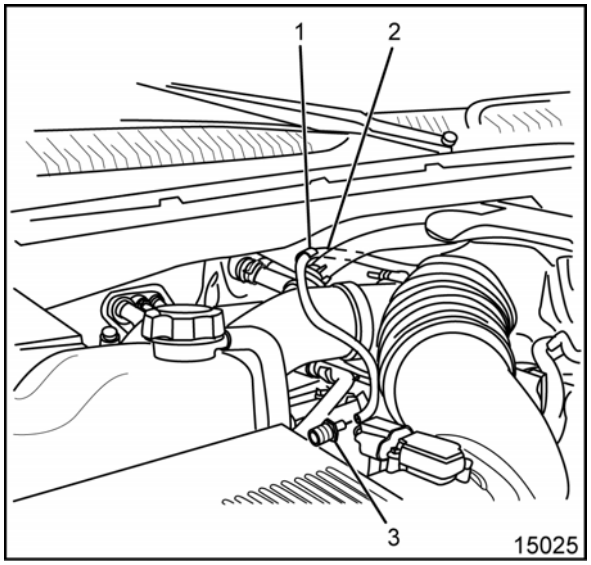
Removal Procedure

1. Remove the accessory panel. Refer to Accessory Panel Replacement in Instrument Panel, Gages and Console.
2. Remove the screws (1) from the meter (2).
3. Remove the meter (2) from the panel.



Installation Procedure

1. Install the meter (2) onto the panel.
2. Install the cover onto the meter with screws (1) and secure.
3. Install the accessory panel. Refer to Accessory Panel Replacement in Instrument Panel, Gages and Console.



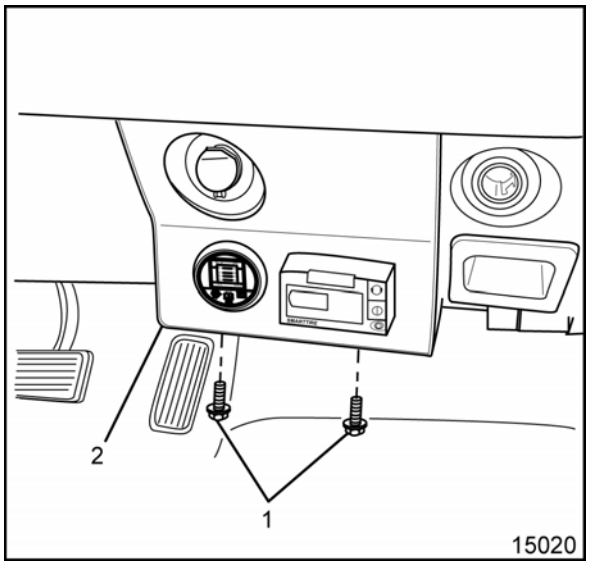
Air Flow Meter Hose Replacement

Removal Procedure

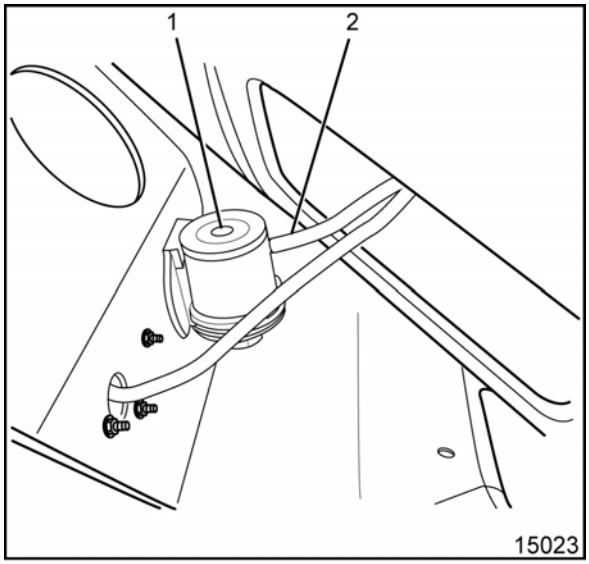
Note routing position prior to removal of hose for installation.

1. Remove the meter hose (2) from the tube adaptor (3).
2. Remove the tube from the cup (1).

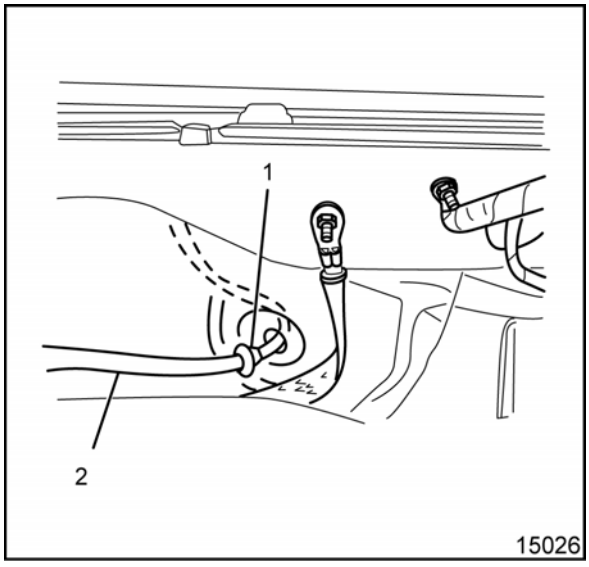
3. Remove the lower bolts (1) of the accessory panel (2).
4. Pull the I/P cluster bezel out at the portion covering the panel.

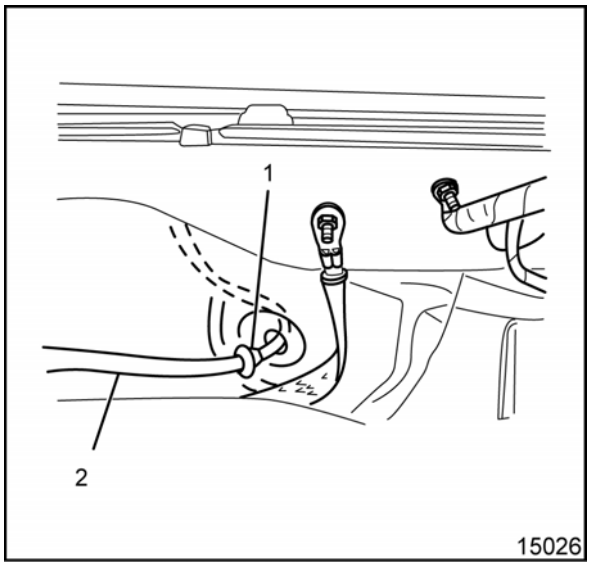


5. Remove panel enough to gain access to the air hose (2).
6. Remove the air hose (2) from the air flow meter (1).



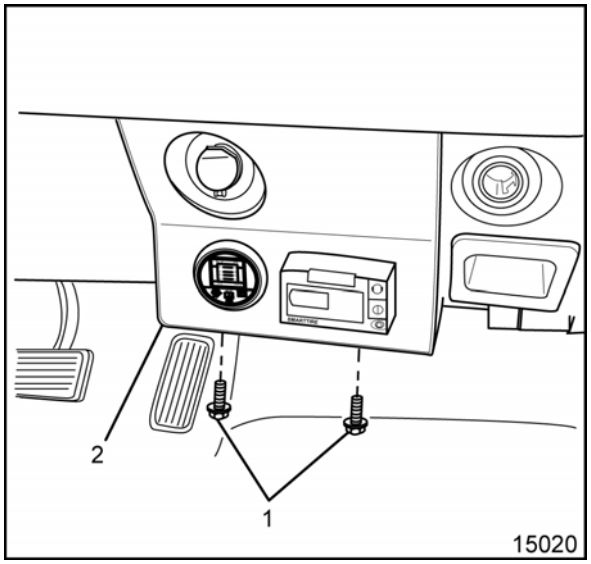
7. Remove the airflow hose grommet (1) from the bulkhead and remove hose (2) from the vehicle.





Installation Procedure

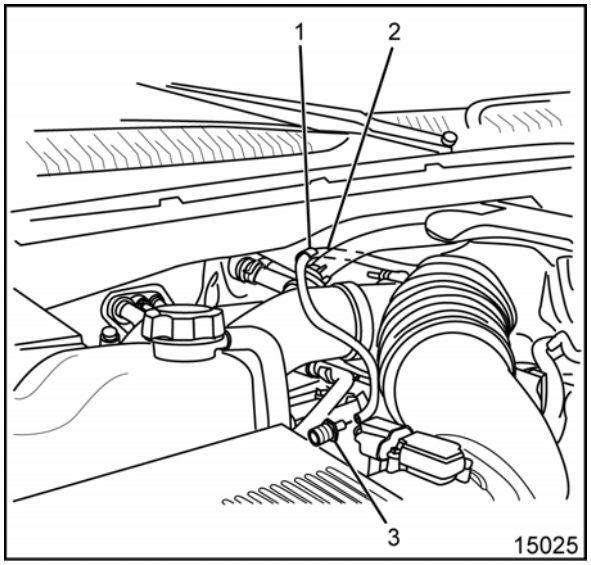
1. Install the air hose (2) with the grommet (1) and secure the grommet into the bulkhead opening.



2. Route the air hose through the I/P in the same location as removed.
3. Install the air hose (2) onto the meter (1).

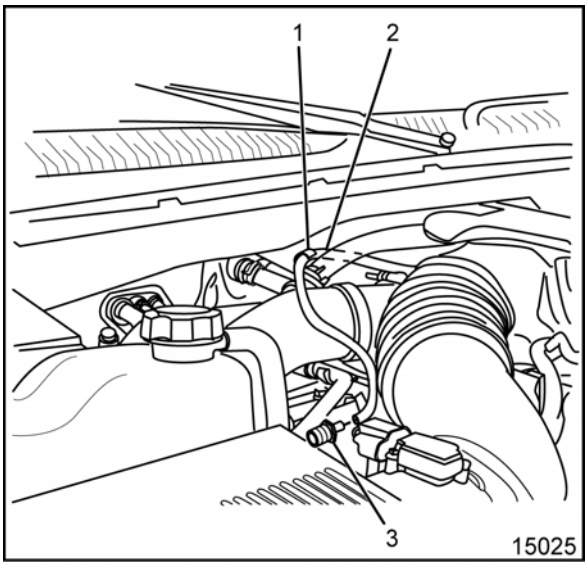
Notice: Refer to Fastener Notice in Cautions and Notices.

4. Install the accessory panel (2) onto the I/P and install bolts (1).
   Tighten
   Tighten bolts to 2 N•m (18 lb in).
5. Push the I/P cluster bezel back in place over the panel.



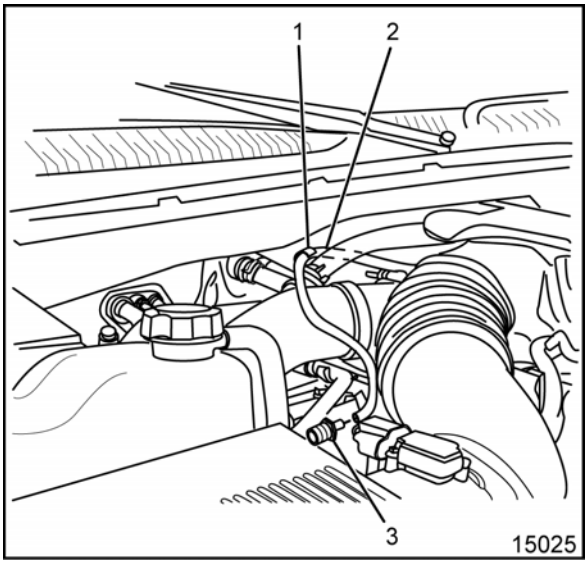
6. Route the air hose (2) through the engine compartment as removed.
7. Secure hose using clip (1).
8. Push the hose (2) onto the tube adapter (3).

Air Flow Adapter Replacement



Removal Procedure

1. Remove the air hose (2) from the adapter (3).
2. Remove the adapter (3) from the air cleaner housing grommet.



Installation Procedure

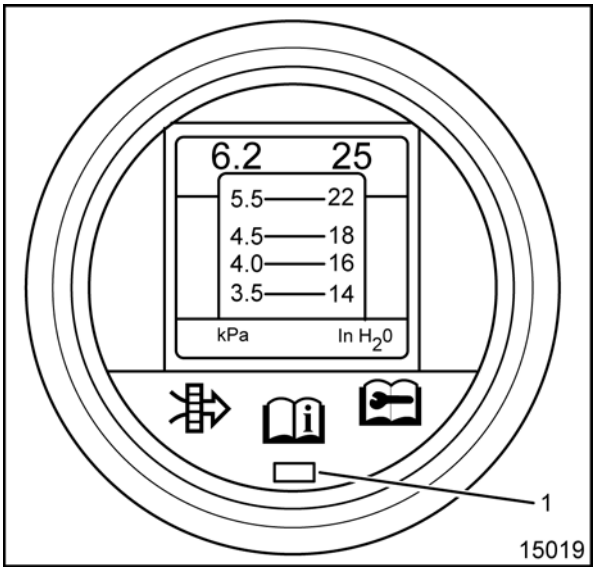
1. Install the adapter (3) into the air cleaner housing grommet until fully seated.
2. Install the air hose (2) onto the adapter (3).

Engine Control Module (ECM) Replacement

The ECM for the enhanced mobility package requires a special ECM calibration. Refer to Engine Control Module (ECM) Replacement in the C/K Truck Service Manual and use the ECM Calibrations found in ECM Calibration Chart of this manual.

Description and Operation

Air Filter Restriction Indicator



The air filter restrictor indicator gage is located in the accessory trim panel on the lower center of the instrument panel. It monitors the engine air filter.

As the filter gets dirty, the yellow indicator will begin to rise. When it reaches the top of the scale, the filter should be replaced.

After replacing the filter, reset the gage by pressing in the yellow reset button (1) at the bottom of the gage.

Engine Control Module (ECM)

The tires have been changed from the original equipment size to those adapted to off-road usage.

The ECM must be reprogrammed using the ECM Calibration Chart of this manual.

Section 8

Body and Accessories

Instrument Panel, Gages and Console 8-3
Specifications 8-3
Repair Instructions 8-4
Accessory Switch Panel Replacement 8-4
Description and Operation 8-6
Instrument Panel and Gages Description 8-6
Bumpers 8-7
Specifications 8-7
Repair Instructions 8-8
Bumper Replacement - Front 8-8
Description and Operation 8-12
Bumpers 8-12
Body Front End 8-13
Specifications 8-13
Repair Instructions 8-14
Radiator Support Reinforcement Replacement – Upper and Lower 8-14
Upper and Lower Fender Reinforcement Replacement 8-16
Description and Operation 8-17
Reinforcement Brackets 8-17
Interior Trim 8-19
Repair Instructions 8-19
Government Vehicle Data Plate Replacement 8-19
Frame and Underbody 8-21
Specifications 8-21
Repair Instructions 8-22
Front Skid Plate Replacement 8-22
Rear Skid Plate Replacement 8-22
Front Support Beam Replacement (Skid Plate) 8-23
Rear Support Beam Replacement (Skid Plate) 8-24
Center Frame Bracket Replacement (Skid Plate) 8-24
Rear Frame Bracket Replacement (Skid Plate) 8-25
Fuel Tank Protection Cover Replacement 8-26
Rear Caliper Cover Replacement 8-27
Rear Mud Flap Replacement 8-28
Description and Operation 8-29
Frame and Underbody Description 8-29

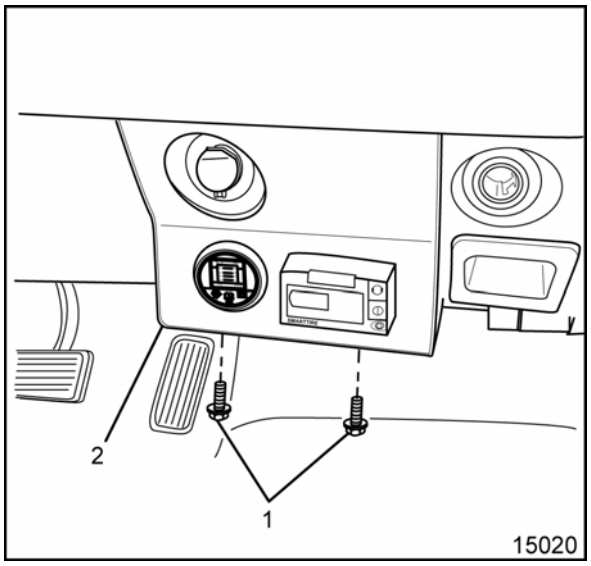
BLANK

Instrument Panel, Gages and Console

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Accessory Panel Bolts	2.0 N•m	18 lb in

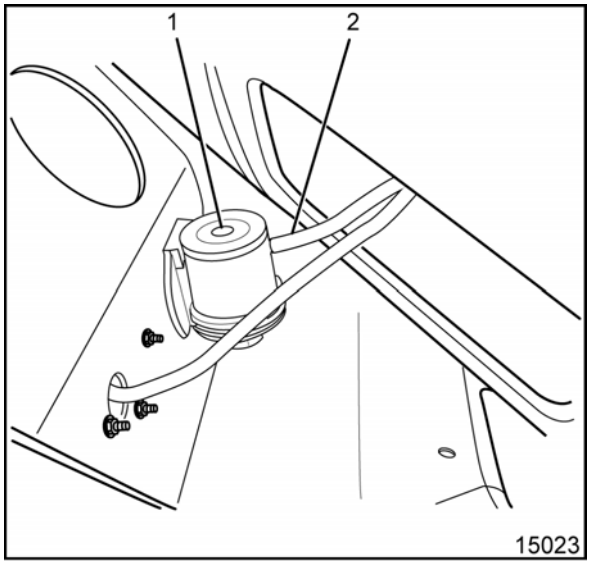


Repair Instructions

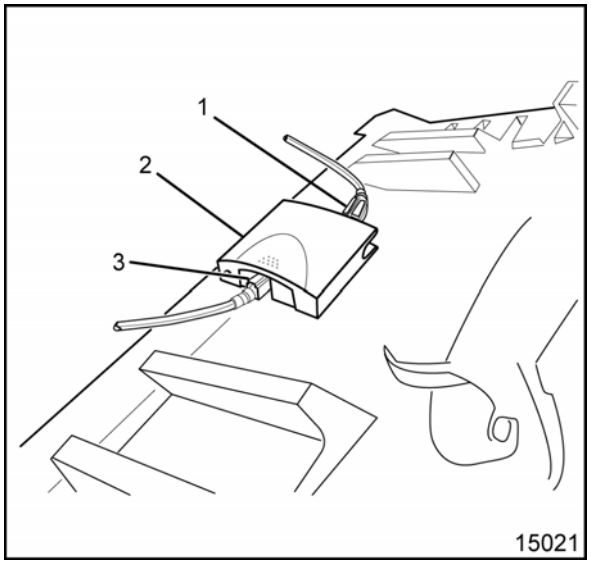
Accessory Switch Panel Replacement

Removal Procedure

1. Remove the lower bolts (1) from the accessory panel.
2. Pull the portion of the I/P cluster bezel above the accessory panel out enough to remove the panel (2).



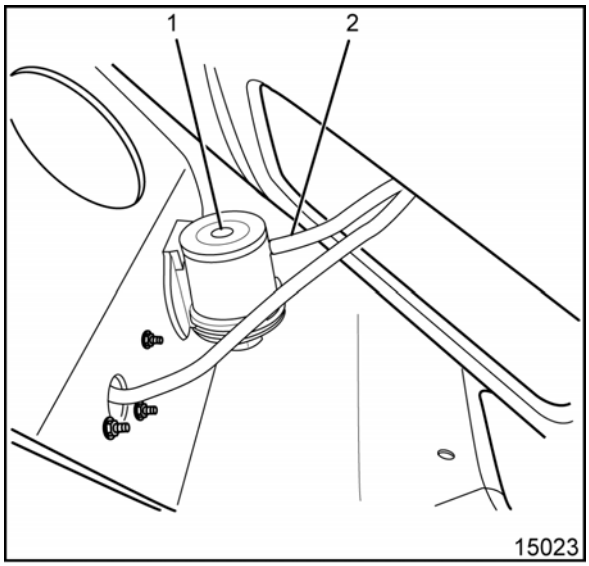
3. Disconnect the hose (2) from the air flow meter (1).



4. Remove the I/P knee bolster panel from the I/P.
5. Disconnect the display harness connector (1) from the tire pressure receiver (2).
6. Remove the accessory panel from the I/P. Note display harness routing for installation.
7. Remove the air flow meter from the panel. Refer to Air Flow Meter Replacement in Engine Controls.
8. Remove the tire pressure display from the panel. Refer to Tire Pressure Display Replacement in Tires and Wheels.

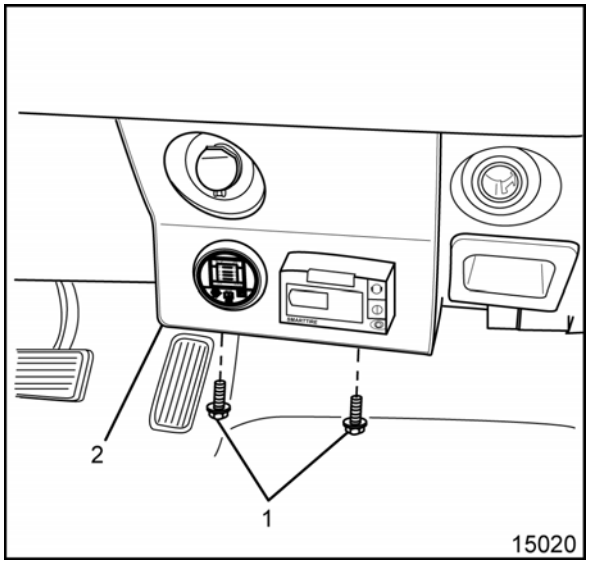
Installation Procedure

1. Install the tire pressure display onto the panel. Refer to Tire Inflation Pressure Display Replacement in Tires and Wheels.
2. Install the air flow meter onto the panel. Refer to Air Flow Meter Replacement in Engine Controls.
3. Route the display wiring harness in the same locations as removed.
4. Install the air flow meter hose (2) onto the port on the meter (1).

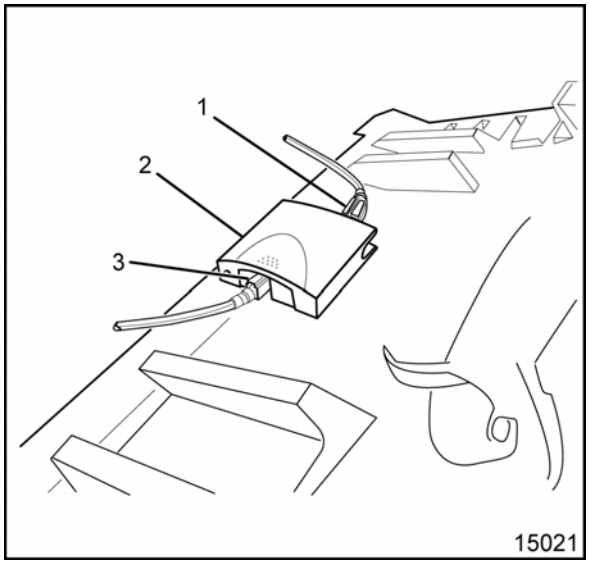


Notice: Refer to Fastener Notice in Cautions and Notices.

5. Install the necessary panel (2) onto the I/P and install bolts (1).
   Tighten
   Tighten bolts to 2 N•m (18 lb in).
6. Push the I/P cluster bezel back in place over the panel.



7. Install the connector (1) of the display into the tire pressure receiver (2).
8. Install the I/P knee bolster panel.



Description and Operation

Instrument Panel and Gages Description

The instrument panel has been modified with a accessory panel mounted below the accessory power outlets. The instrument panel houses auxiliary harnesses as well as standard indicators.

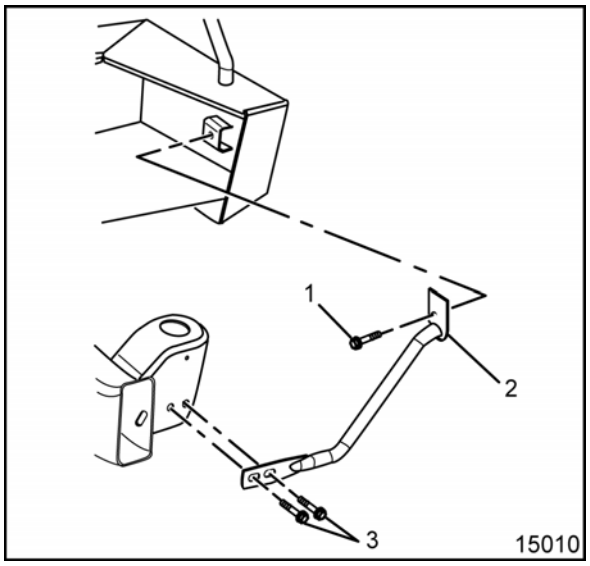
Some modifications have been made to the instrument panel to accommodate auxiliary harness connections and convenience/fuse centers.

Bumpers

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Bumper Bolts	85 N•m	63 lb ft
Front Bumper Support to Bumper Bolts	85 N•m	63 lb ft
Front Bumper Support to Frame Bolts	55 N•m	41 lb ft



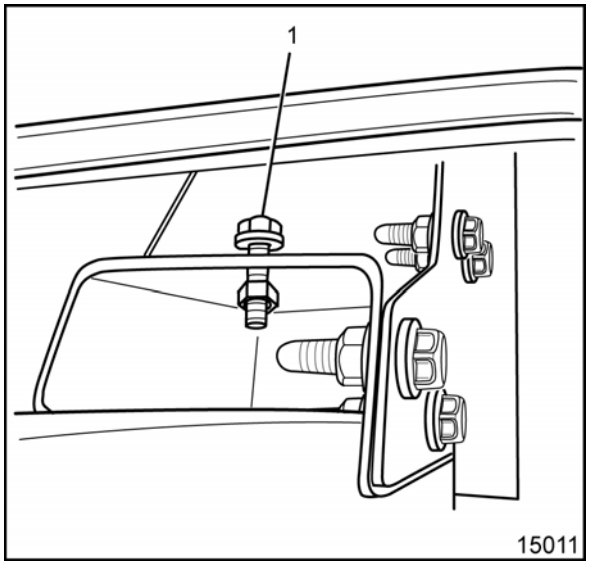
Repair Instructions

Bumper Replacement - Front

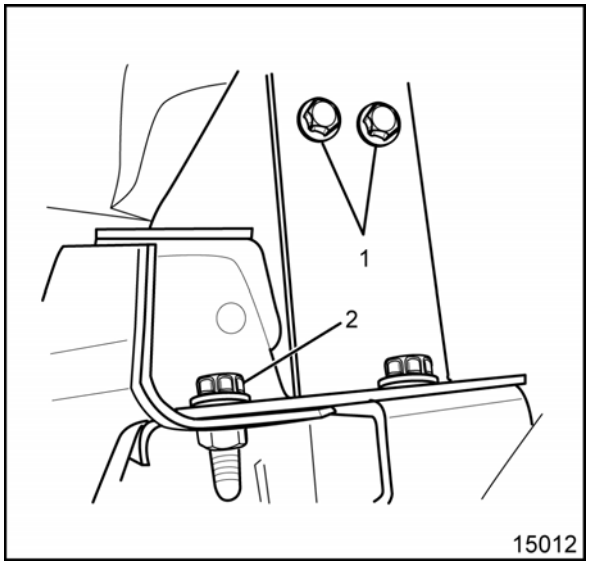
Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and support the vehicle.
2. Remove the bumper support bolts (1) from the right and left side.
3. Remove the bumper support bolts (3) from the right and left side.
4. Remove the side bumper support (2) from the right and left side.

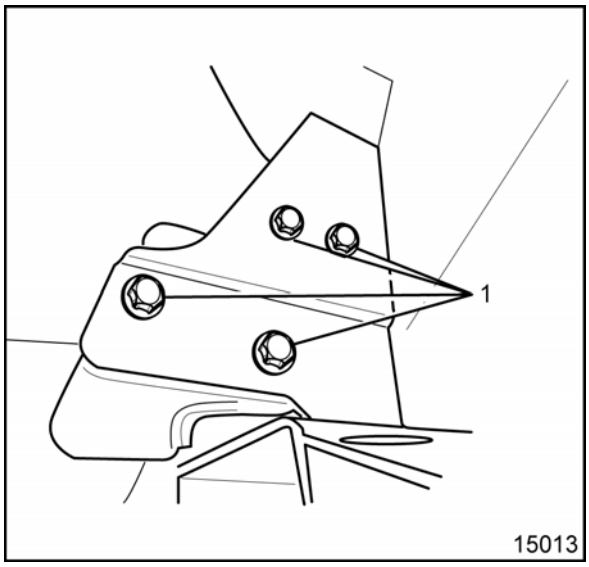


5. Remove the upper bolt (1) from the right and left side of the bumper.

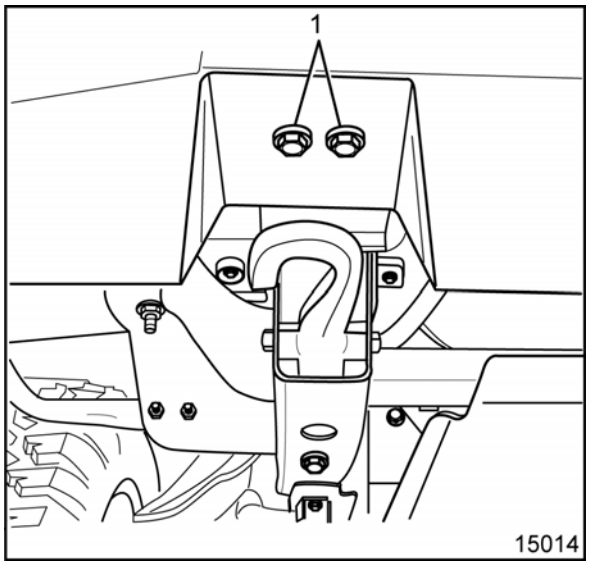


6. Remove the top inner top bumper bolts (1) from the right and left side.
7. Remove the lower inner bumper bolt (2) from the right and left side.

8. Remove the outer bumper bolts (1) from the right and left side.

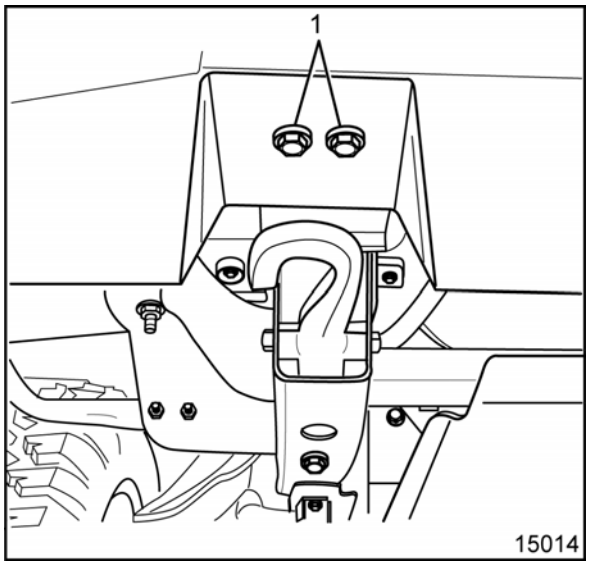


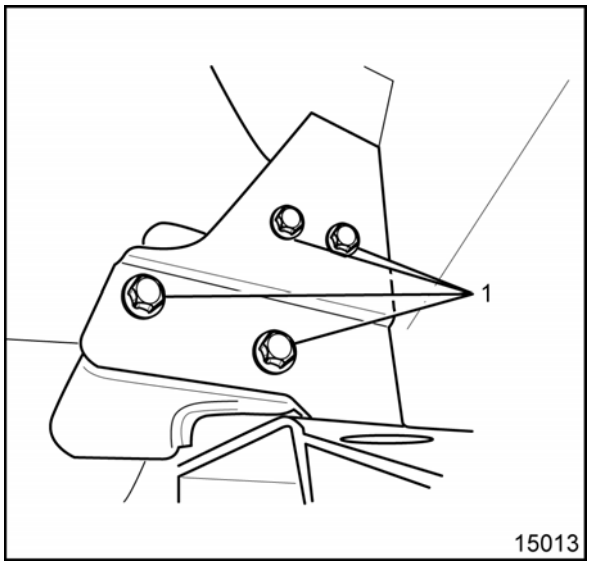
9. Support the bumper assembly using an approved support system.
10. Remove the lower front bumper bolts (1) from the right and left side.
11. Using the aid of an assistant, remove the front bumper from the vehicle.



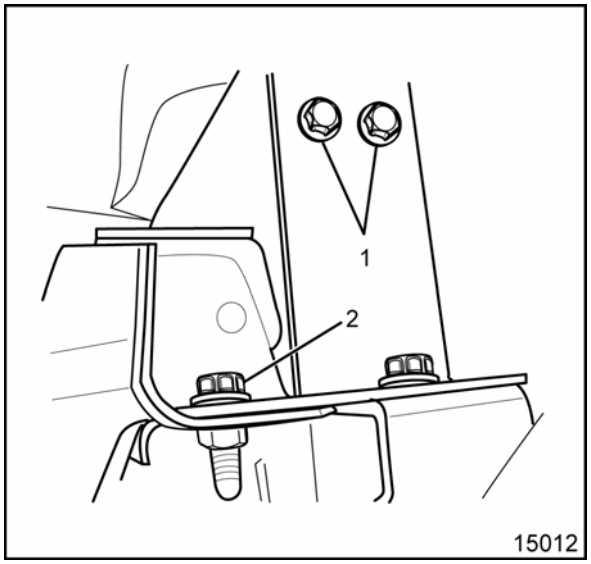
Installation Procedure

1. Using the aid of an assistant, position the bumper assembly onto the vehicle.
2. Support the bumper assembly by using an approved support system.
3. Install the lower front bumper bolts (1) on the right and left side and hand tighten.

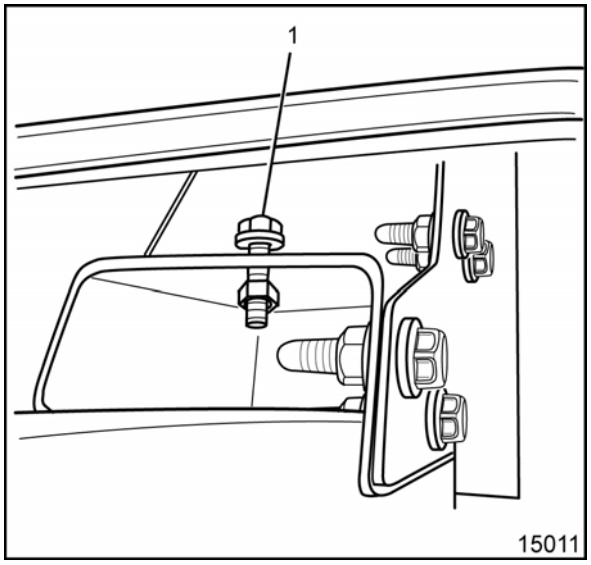




4. Install the outer bumper bolts (1) on the right and left side and hand tighten.



5. Install the inner lower bolts (2) on the right and left side and hand tighten.
6. Install the inner top bumper bolts (1) on the right and left side and hand tighten.

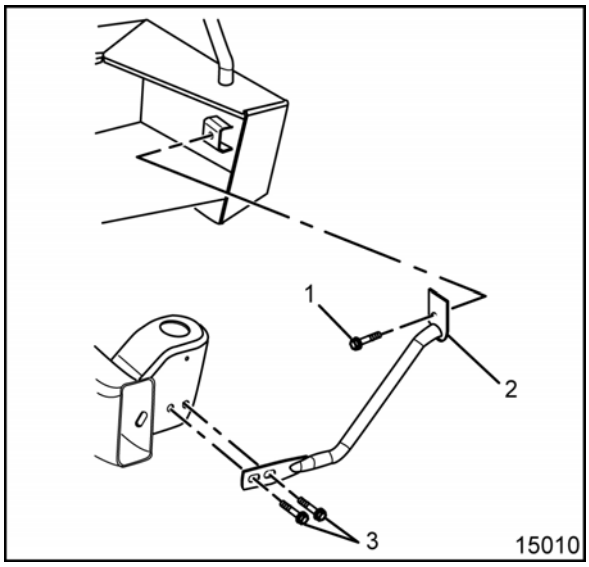


7. Install the upper bolt (1) on the right and left side and hand tighten.

Notice: Refer to Fastener Notice in Cautions and Notices.

8. Align the front bumper to the vehicle and tighten all bolts.
   Tighten
   Tighten bolts to 85 N•m (63 lb ft).

9. Install the bumper support (2) and bolt (1).
   Tighten
   Tighten bolt to 85 N•m (63 lb ft).
10. Install the bumper support bolts (3).
    Tighten
    Tighten bolts to 55 N•m (41 lb ft).
11. Remove supports and lower the vehicle.



Description and Operation

Bumpers

The front bumper assembly provided in this package is rugged and durable and is designed for the rigors of limited off-road conditions. The full width bumper and brush guard help protect the vehicles front end and front fenders from damage.

Body Front End

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Fender Bolt	25 N•m	18 lb ft
Front Body Mount Nut	70 N•m	52 lb ft
Fender Reinforcement Bolt	4 N•m	35 lb in

Repair Instructions

Radiator Support Reinforcement Replacement – Upper and Lower

Removal Procedure

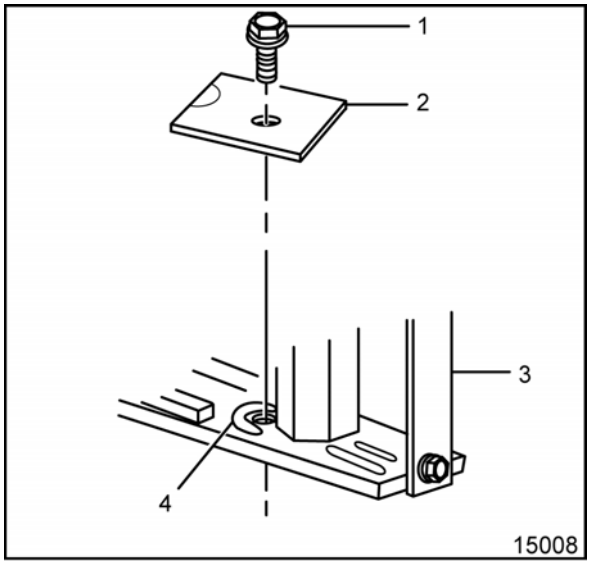
Important: Ensure that the vehicle is unloaded prior to reinforcement replacement.

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and support the vehicle.
2. Remove the front bumper. Refer to Bumper Replacement in Bumpers.
3. Remove the body mount nut and bolt of the reinforcement that is being replaced. Loosen the other body mount nuts.
4. Properly support the body in the area that the mounts will be replaced.

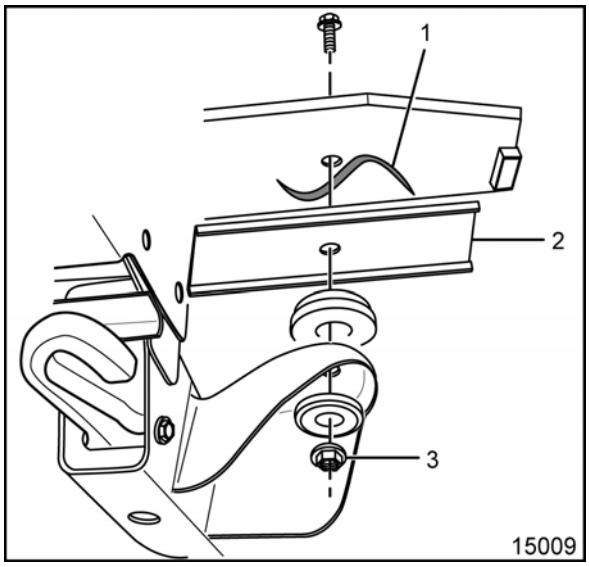
Caution: When you remove the reinforcements, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guidelines outlined below:

- ***Intermediate steering shaft ' Do not allow the shaft to extend more than 25 mm (1 in).***
- ***Park Brake Cable – Leave slack in the cable.***
- ***Body ground straps – Leave slack in the wire.***



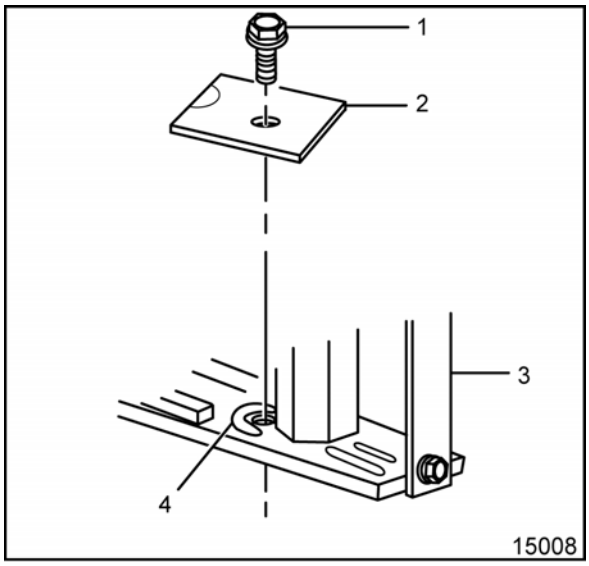
5. Lower the chassis accordingly in order to remove the reinforcement as necessary.
6. Using a flat bladed tool, separate the upper reinforcement (2) from the radiator support (3).

7. Using a flat bladed tool. Separate the lower reinforcement (2).
8. Remove the radiator support reinforcements from the vehicle.



Installation Procedure

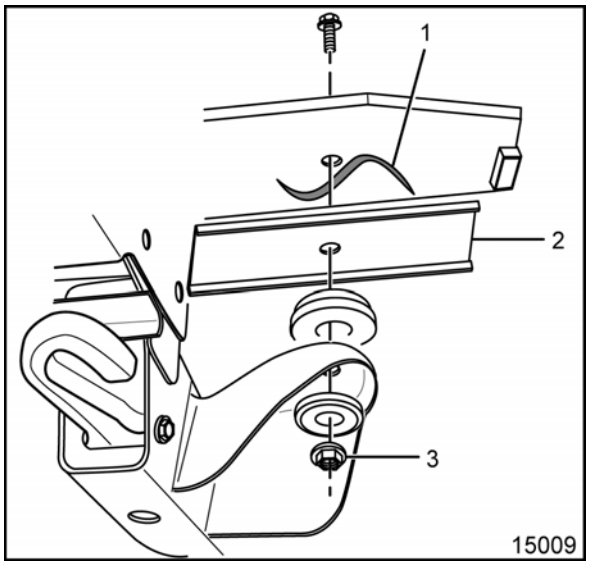
1. Remove any old panel bonding adhesive from the radiator support.
2. Apply panel bonding adhesive (4) to the upper reinforcement (2).

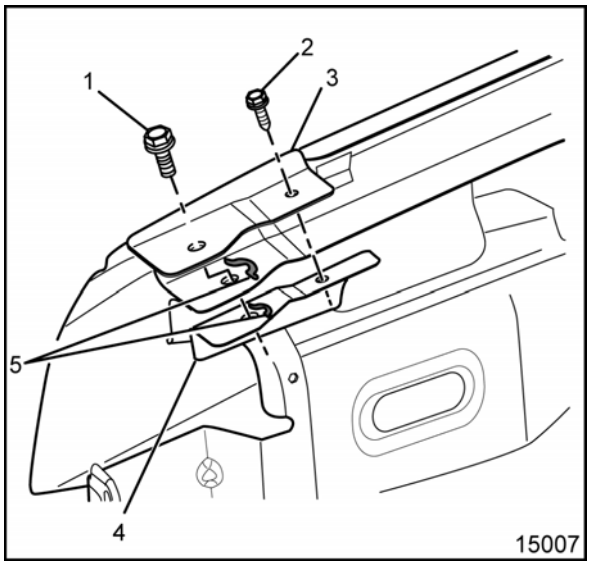


3. Apply panel bonding adhesive (1) to the lower reinforcement (2).
4. Install the upper reinforcement onto the radiator support.

Notice: Refer to Fastener Notice in Cautions and Notices.

5. Install the body mount bolt and nut (3).
6. Raise the vehicle chassis and tighten the body mount nuts.
   Tighten
   Tighten body mounts to 70 N•m (52 lb ft).
7. Remove the supports and lower the vehicle.

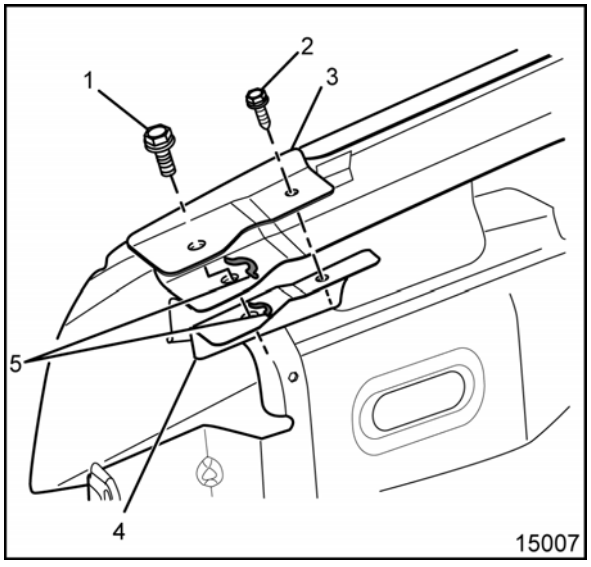




Upper and Lower Fender Reinforcement Replacement

Removal Procedure

1. Open the vehicle hood.
2. Remove the reinforcement bolt (2).
3. Remove the fender support bolt (1).
4. Using a flat bladed tool, separate the upper (3) and lower (4) reinforcement from the bonding adhesive securing them to the fender.
5. Remove the upper (3) and lower (4) reinforcements from the fender.



Installation Procedure

1. Remove any old panel bonding adhesive from the fender.
2. Apply panel bonding adhesive (5) to the upper and lower reinforcements.
3. Install upper (3) and lower (4) reinforcements onto the fender.

Notice: Refer to Fastener Notice in Cautions and Notices.

4. Install the fender bolt (1).
   Tighten
   Tighten the bolt to 25 N•m (18 lb ft).
5. Install the reinforcement bolt (2).
   Tighten
   Tighten the bolt to 4 N•m (35 lb in).
6. Close the vehicle hood. Verify correct fender alignment.

Description and Operation

Reinforcement Brackets

Reinforcement brackets are used to minimize structural damage cause by severe off-road conditions. The reinforcement brackets minimize or lessen the concentration of stress in small areas of the radiator and fender support areas.

BLANK

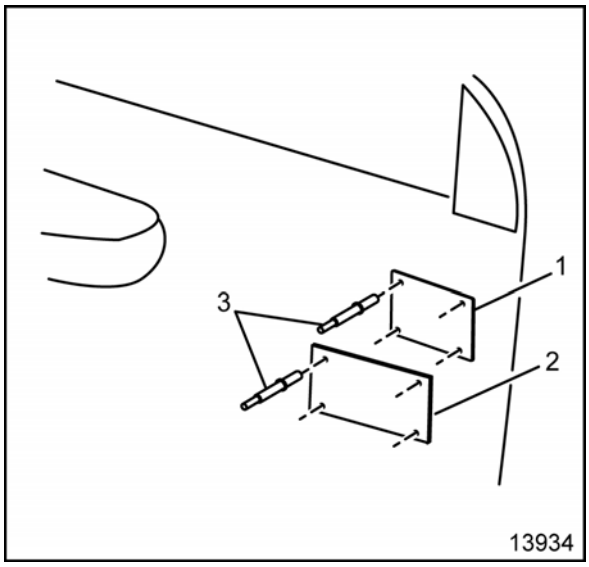
Interior Trim

Repair Instructions

Government Vehicle Data Plate Replacement

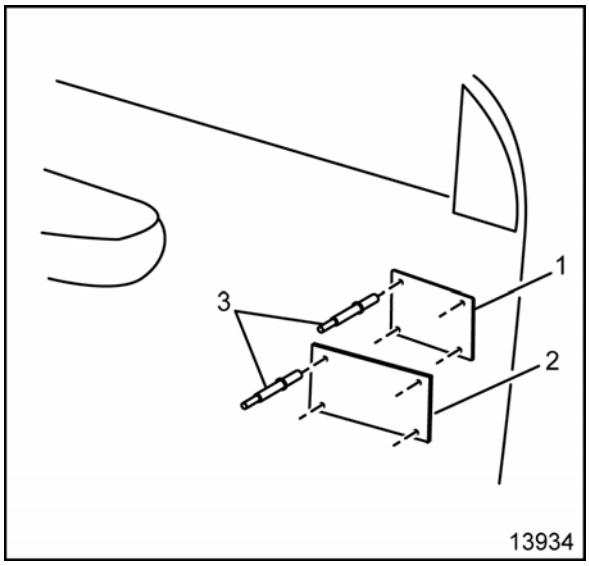
Removal Procedure

1. Drill out the 4 rivets (3).
2. Remove the data plate (1).



Installation Procedure

1. Install the plate (1) to the original holes.
2. Install the 4 new rivets (3).



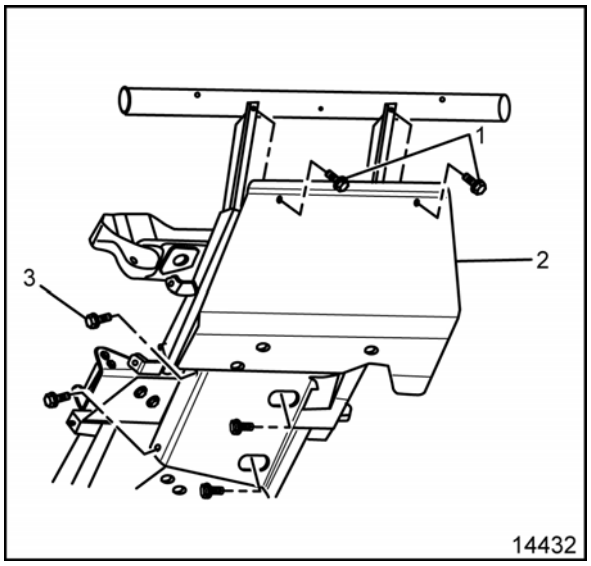
BLANK

Frame and Underbody

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Center Support Beam Bolts (Pass Through)	60-68 N•m	44-50 lb ft
Center Support Beam Bolts (Threaded Hole)	40-47 N•m	30-35 lb ft
Front Fuel Tank Cover Bolts	50 N•m	37 lb ft
Front Outer Fuel Tank Cover Bolts	29 N•m	21 lb ft
Front Skid Plate Bolts (Front)	21 N•m	15 lb ft
Front Skid Plate Bolts (Rear)	35 N•m	26 lb ft
Inner Fuel Tank Cover Bolts	29 N•m	21 lb ft
Rear Caliper Cover Nuts	45 N•m	33 lb ft
Rear Caliper Slide Bolts	180 N•m	133 lb ft
Rear Fender Support Bolt	25 N•m	18 lb ft
Rear Mud Flap Bolts	4 N•m	35 lb in
Rear Outer Fuel Tank Cover Bolts	85 N•m	63 lb ft
Rear Skid Plate Bolts	35 N•m	26 lb ft
Rear Support Beam Bolts	60-68 N•m	44-50 lb ft
Skid Plate Support Beam Bolts	35 N•m	26 lb ft



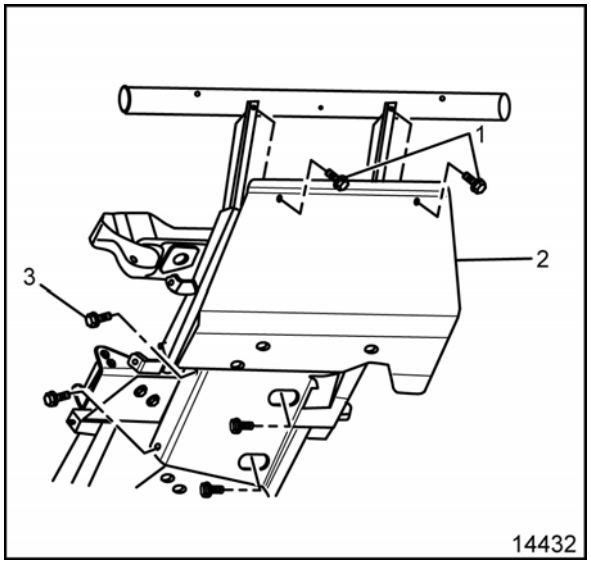
Repair Instructions

Front Skid Plate Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and support the vehicle.
2. Remove the bolts (1) from the front of the skid plate.
3. Remove the bolts (3) from the rear of the skid plate.
4. Remove the skid plate (2) from the vehicle.

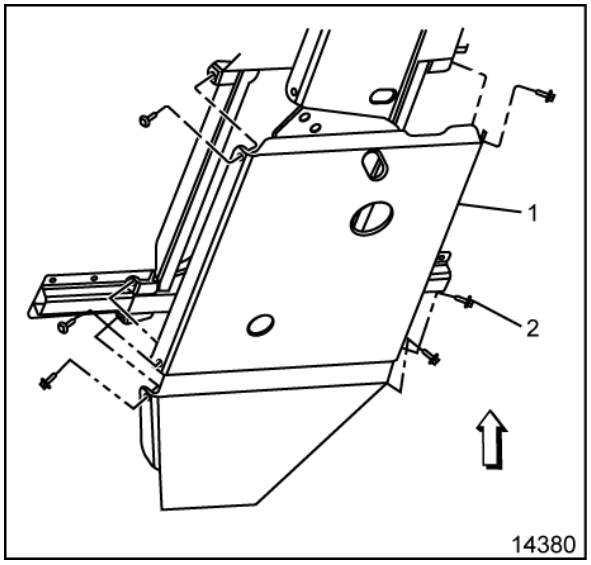


Installation Procedure

1. Install the skid plate to the vehicle.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the rear bolts (3).
   Tighten
   Tighten the bolts to 35 N•m (26 lb ft).
3. Install the front bolts (1).
   Tighten
   Tighten the bolts to 21 N•m (15 lb ft).
4. Remove the safety stands.
5. Lower the vehicle.



Rear Skid Plate Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

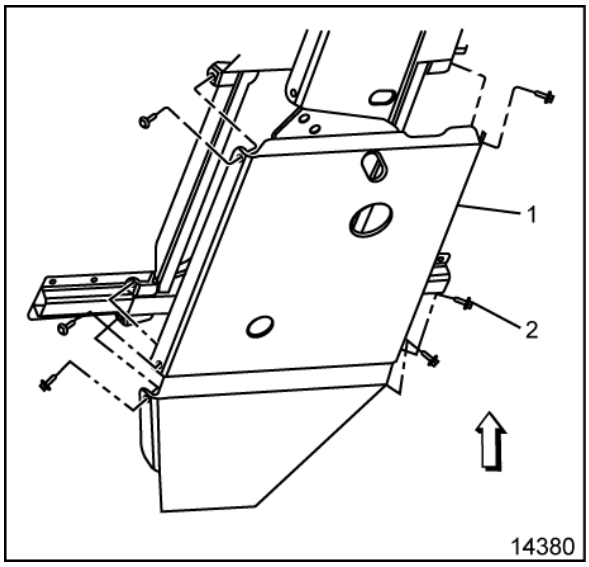
1. Raise and support the vehicle.
2. Support the skid plate and remove the bolts (2).
3. Remove the support and remove the skid plate (1).

Installation Procedure

1. Install the skid plate support.

Notice: Refer to Fastener Notice in Cautions and Notices.

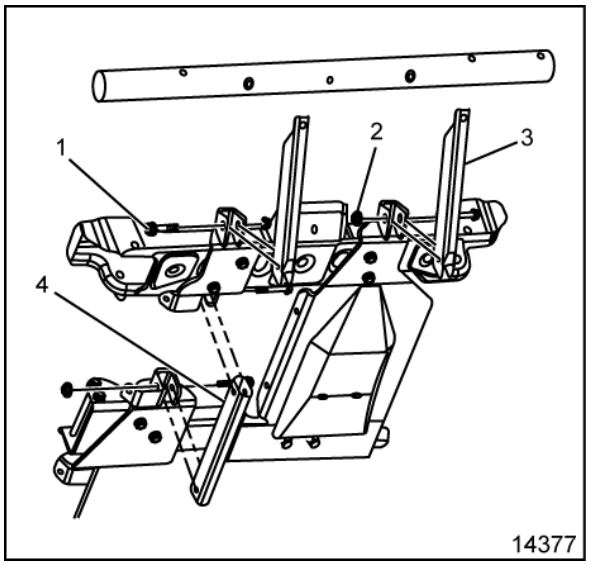
2. Install the bolts (2) and remove support.
   Tighten
   Tighten bolts to 35 N•m (26 lb ft).
3. Remove the safety stands.
4. Lower the vehicle.



Front Support Beam Replacement (Skid Plate)

Removal Procedure

1. Remove the front skid plate. Refer to Front Skid Plate Replacement.
2. Remove the bolts (1) and nuts (2).
3. Remove the support beam (3) and (4).

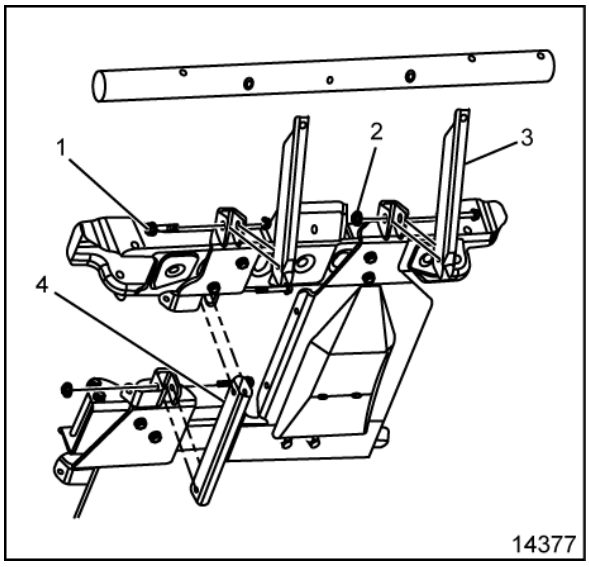


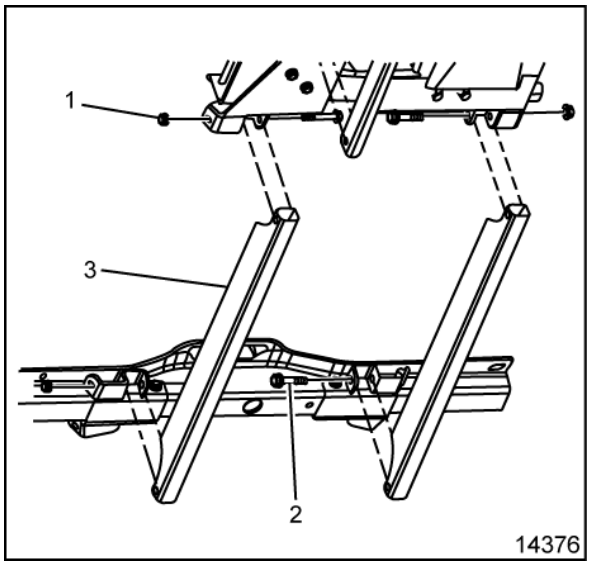
Installation Procedure

1. Install the support beam (3) and (4).

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolts (1) and nuts (2).
   Tighten
   Tighten nuts and bolts to 35 N•m (26 lb ft).
3. Install the front skid plate. Refer to Front Skid Plate Replacement.

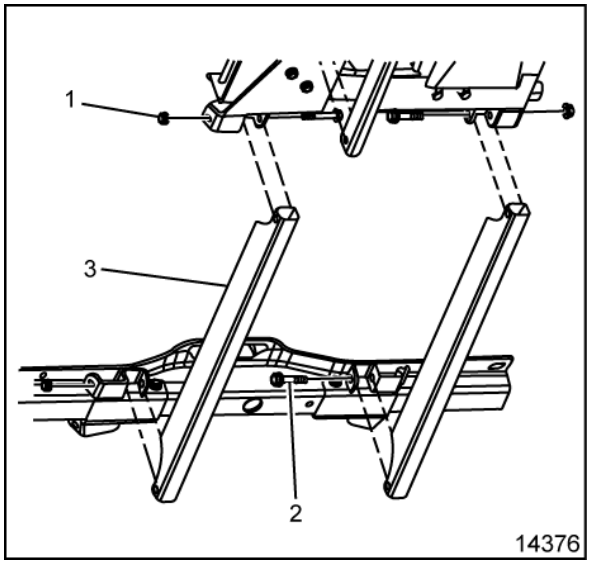




Rear Support Beam Replacement (Skid Plate)

Removal Procedure

1. Remove the rear skid plate. Refer to rear Skid Plate Replacement.
2. Remove the nuts (1) and bolts (2).
3. Remove the support beams (3).

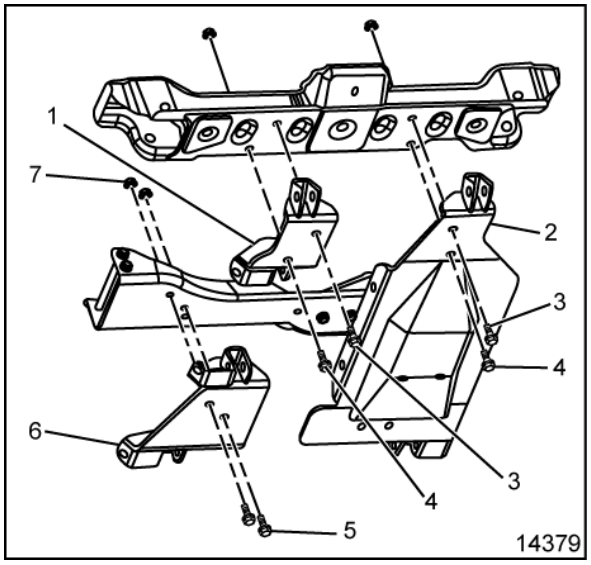


Installation Procedure

1. Install the support beams (3).

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolts (2) and nuts (1).
   Tighten
   Tighten nuts and bolts to 35 N•m (26 lb ft).
3. Install the rear skid plate. Refer to Rear Skid Plate Replacement.

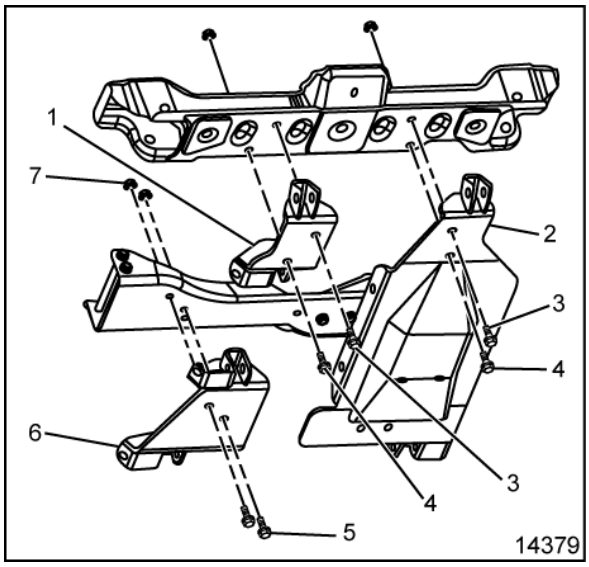


Center Frame Bracket Replacement (Skid Plate)

Removal Procedure

1. Remove the front skid plate. Refer to Front Skid Plate Replacement.
2. Remove the rear skid plate. Refer to Rear Skid Plate Replacement.
3. Remove the rear support beams. Refer to Rear Support Beam Replacement (Skid Plate).
4. Remove the front support beams. Refer to Front Support Beam Replacement (Skid Plate).
5. Remove the nuts (7) and bolts (3, 4) and (5) securing the brackets to the crossmembers.
6. Remove the brackets (1, 2) and (6) from the vehicle.

Installation Procedure

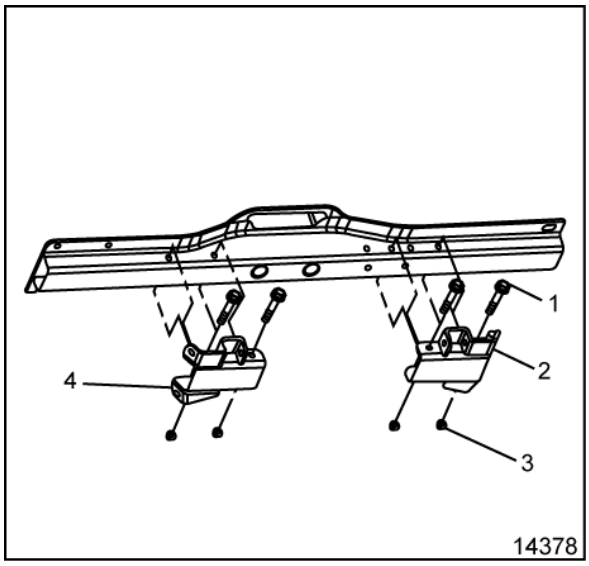


1. Install the brackets (1, 2) and (6) on the vehicle.

Notice: Refer to Fastener Notice in Cautions and Notices.

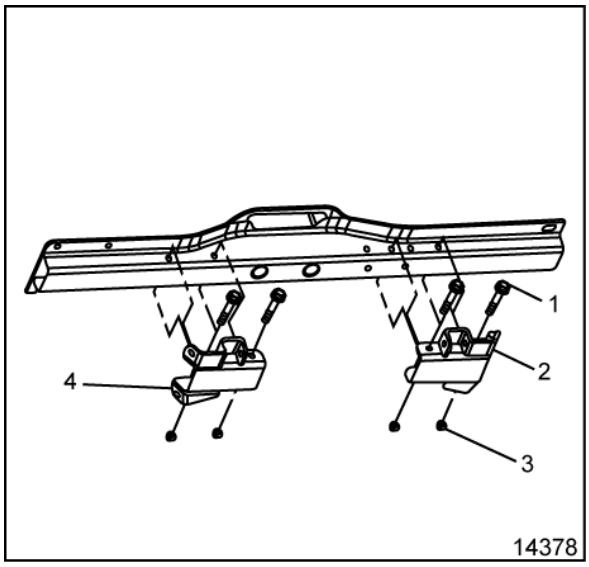
2. Install the bolts (3, 4) and (5) and nuts (1).
   Tighten
   - Tighten bolts (4, 5) to 60-68 N•m (44-50 lb ft).
   - Tighten bolts (3) to 40-47 N•m (30-35 lb ft).
3. Install the front support beams. Refer to Front Support Beam Replacement (Skid Plate).
4. Install the rear support beams. Refer to Rear Support Beam Replacement (Skid Plate).
5. Install the rear skid plate. Refer to Rear Skid Plate Replacement.
6. Install the front skid plate. Refer to Front Skid Plate Replacement.

Rear Frame Bracket Replacement (Skid Plate)



Removal Procedure

1. Remove the rear skid plate. Refer to Rear Skid Plate Replacement.
2. Remove the rear support beam. Refer to Rear Support Beam Replacement (Skid Plate).
3. Remove the nuts (3) and bolts (1).
4. Remove the rear mounts (2) and (4).

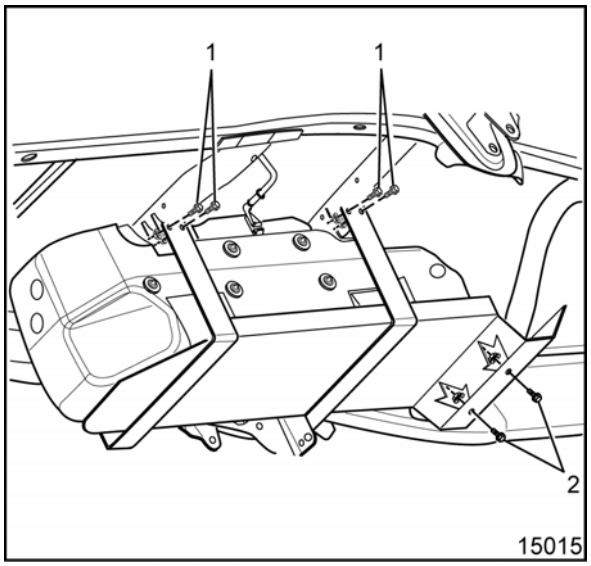


Installation Procedure

1. Install the rear mounts (2) and (4).

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolts (1) and nuts (3).
   Tighten
   Tighten nuts and bolts to 60-68 N•m (44-50 lb ft).
3. Install the rear support beams. Refer to Rear Support Beam Replacement (Skid Plate).
4. Install the rear skid plate. Refer to Rear Skid Plate Replacement.

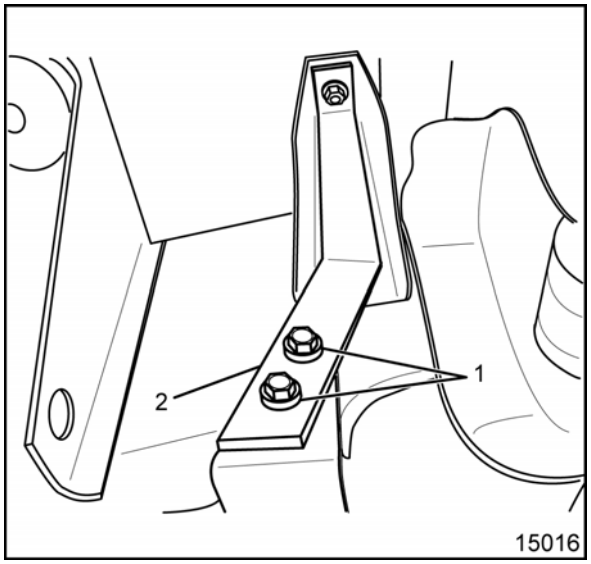


Fuel Tank Protection Cover Replacement

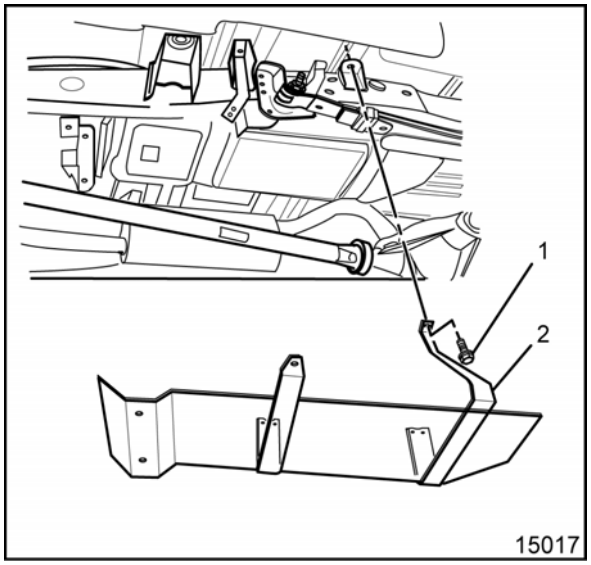
Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and support the vehicle.
2. Support the fuel tank cover.
3. Remove the cover bolts (2).
4. Remove the inner cover bolts (1).

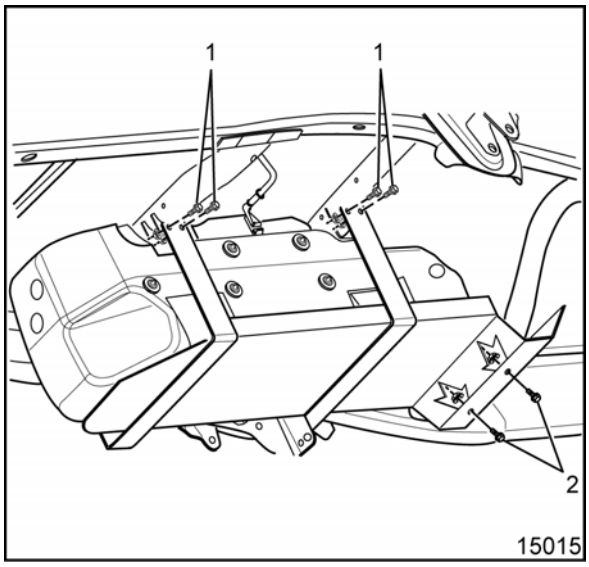


5. Remove the outer front cover bolts (1) from the support (2).



6. Remove the cover bolts (1), remove support and lower the cover (2). Remove from the vehicle.

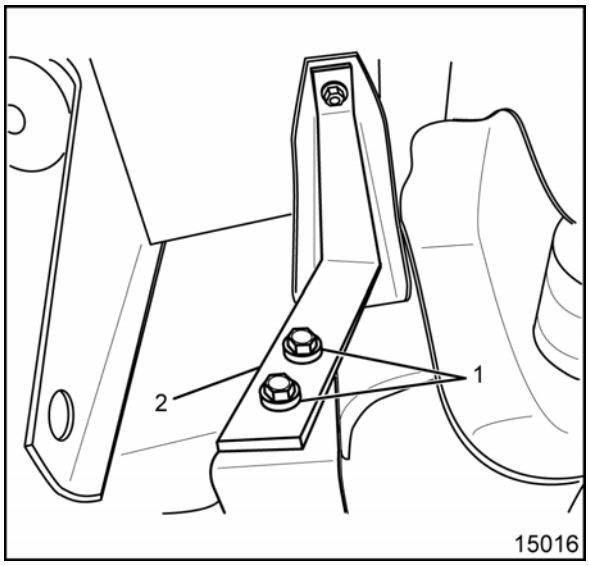
Installation Procedure



1. Install the cover and support.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the cover bolt (1).
   Tighten
   Tighten bolt to 29 N•m (21 lb ft).
3. Install the front cover bolts (2).
   Tighten
   Tighten bolts to 50 N•m (37 lb ft).

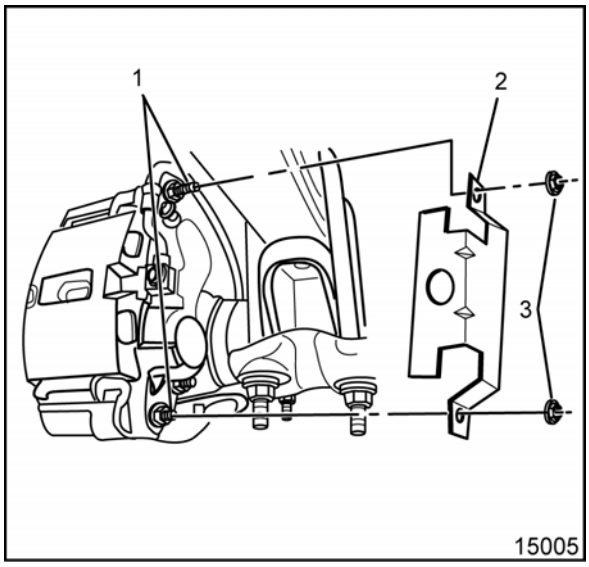


4. Install the upper cover bolt.
   Tighten
   Tighten bolts to 85 N•m (63 lb ft).
5. Install the outer front bolts (1).
   Tighten
   Tighten bolts to 29 N•m (21 lb ft).
6. Remove fuel tank support.
7. Remove vehicle supports and lower the vehicle.

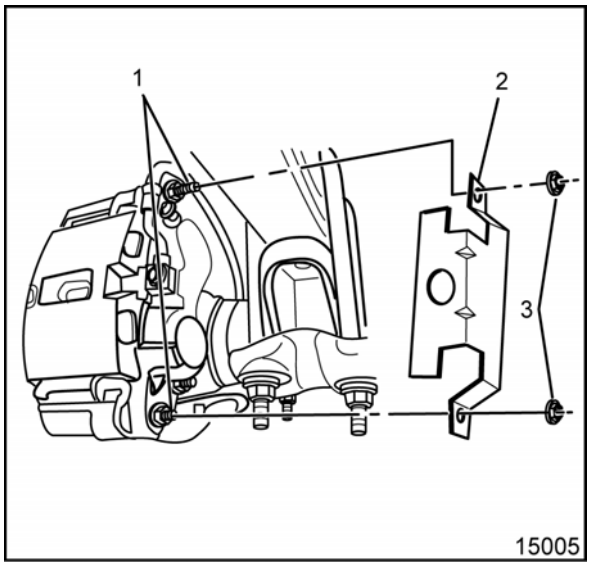
Rear Caliper Cover Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.



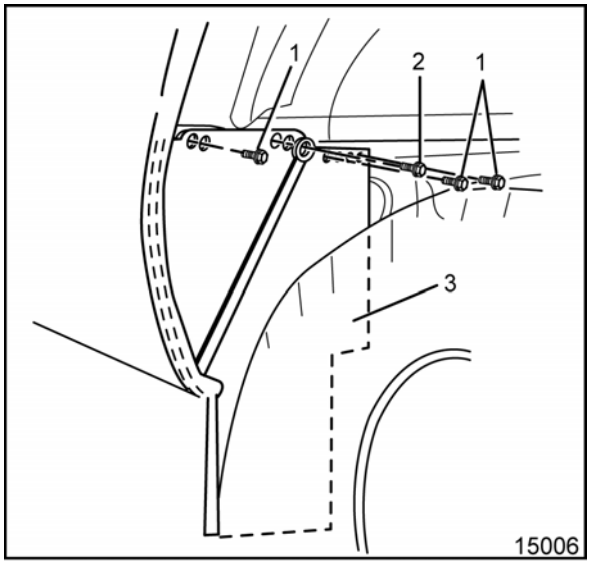
1. Raise and support the vehicle.
2. Remove the cover nuts (3).
3. Remove the caliper cover (2).
4. If damaged remove the caliper slide pins (1).



Installation Procedure

Notice: Refer to Fastener Notice in Cautions and Notices.

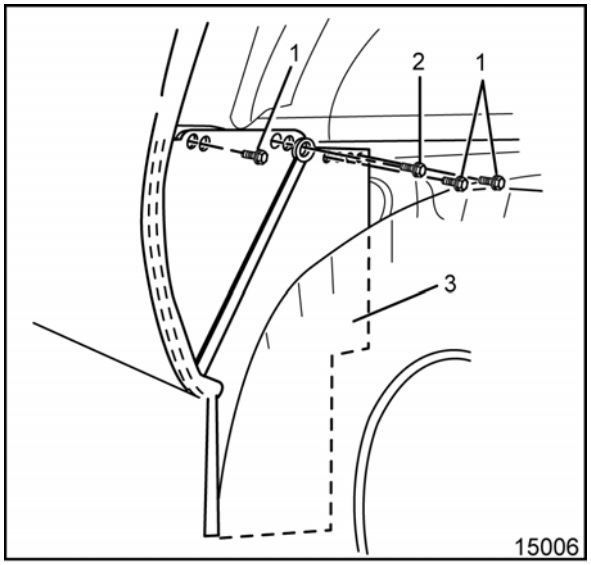
1. If removed, install the caliper slide pins (1).
   Tighten
   Tighten slide pins to 180 N•m (133 lb ft).
2. Install the caliper cover (2).
3. Install the cover nuts (3).
   Tighten
   Tighten cover nuts 45 N•m (33 lb ft).
4. Remove supports and lower the vehicle.



Rear Mud Flap Replacement

Removal Procedure

1. Remove the fender brace bolt (2).
2. Remove the bolts (1) securing the flap to the body.
3. Remove the mud flap (3) from the vehicle.



Installation Procedure

1. Install the mud flap (3) onto the body.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolts (1) through the mud flap and into the body.
   Tighten
   Tighten bolts to 4 N•m (35 lb in).
3. Install the bolt (2) through the fender support and mud flap and into the body.
   Tighten
   Tighten bolt to 25 N•m (18 lb ft).

Description and Operation

Frame and Underbody Description

Underbody Protection

The underbody protection covers are mounted to the frame. In off-road conditions these covers will protect the enclosed components from damage.

The covers do not affect the operation of the vehicle and allow full access to maintenance items.

BLANK

A

Accessory Switch Panel Replacement 8-4
Air Filter Restriction Indicator 6-10
Air Flow Adapter Replacement 6-9
Air Flow Meter Hose Replacement 6-6
Air Flow Meter Replacement 6-6
Axle
  Description
    Front Axle Vent Tube Filter Description 4-4
    Rear Vent Tube Filter Description 4-6
  Repair
    Front Axle Vent Tube Filter Replacement 4-3
    Rear Vent Tube Filter Replacement 4-5

B

Battery Reinforcement Bracket Replacement 6-4
Beadlock Tire
  Tires and Wheel
    Description
      Beadlock Tire System 3-28
Body Front End
  Description
    Reinforcement Brackets 8-17
  Repair
    Radiator Support Reinforcement
      Replacement – Upper and Lower 8-14
    Upper and Lower Fender Reinforcement
      Replacement 8-16
  Specifications
    Fastener Tightening 8-13
Bumpers
  Repair
    Bumper Replacement - Front 8-8
Bumpers
  Description
    Bumpers 8-12
  Specifications
    Fastener Tightening Specifications 8-7

C

Center Frame Bracket Replacement
  (Skid Plate) 8-24

E

Engine Control Module (ECM) 6-10
Engine Control Module (ECM) Replacement 6-9
Engine Controls
  Description
    Air Filter Restriction Indicator 6-10
    Engine Control Module 6-10
  Repair
    Air Flow Adapter Replacement 6-9
    Air Flow Meter Hose Replacement 6-6
    Air Flow Meter Replacement 6-6
    Engine Control Module (ECM)
      Replacement 6-9
  Specifications
    ECM Calibration 6-5
Engine Controls
  Specifications
    Fastener Tightening 6-5
Engine Electrical
  Repair
    Battery Reinforcement Bracket
      Replacement 6-4
Engine Electrical
  Specifications
    Fastener Tightening 6-3
Enhanced Mobility Package Vehicle 0-3

F

Frame and Underbody
  Repair
    Front Skid Plate Replacement 8-22
    Front Support Beam Replacement
      (Skid Plate) 8-23
    Fuel Tank Protection Cover Replacement 8-26
    Rear Caliper Cover Replacement 8-27
    Rear Frame Bracket Replacement
      (Skid Plate) 8-25
    Rear Mud Flap Replacement 8-28
    Rear Skid Plate Replacement 8-22
Frame and Underbody
  Description
    Frame and Underbody Description 8-29
  Repair
    Center Frame Bracket Replacement
      (Skid Plate) 8-24
    Rear Support Beam Replacement
      (Skid Plate) 8-24
  Specifications
    Fastener Tightening 8-21
Front Drive Axle
  Description
    Front Axle Vent Tube Filter 4-4
  Repair
    Front Axle Vent Tube Filter Replacement 4-3
Front Support Beam Replacement (Skid Plate) 8-23
Front Suspension
  Description
    Front Enhanced Suspension 3-9
    Front Hydraulic Jounce Bumper
      Description 3-9
    Front Shock Absorber Description 3-9
  Repair
    Jounce Shock Absorber Replacement 3-8
  Repair
    Lower Jounce Control Arm Replacement 3-6
    Shock Absorber Replacement 3-4
Front Suspension

Specifications
Fastener Tightening....3-3
Fuel Tank Protection Cover Replacement....8-26

G

Government Data Plate....0-5
Government Vehicle Data Plate Replacement....8-19

I

Identification, Vehicle....0-3
Instrument Panel, Gages and Console
Repair
Accessory Switch Panel Replacement....8-4
Instrument Panel, Gages and Console
Description
Instrument Panel and Gages Description....8-6
Specifications
Fastener Tightening....8-3
Interior Trim
Repair
Government Vehicle Data Plate Replacement....8-19

J

Jack Mounting Bracket Replacement....3-27
Jounce Shock
Repair
Jounce Shock Absorber Replacement....3-8

L

Labels
Government Data Plate....0-5
Lower Jounce
Repair
Lower Jounce Control Arm Replacement....3-6

M

Maintenance
Owner Checks and Services....0-7
Periodic Maintenance Inspection....0-7
Monitor Display Replacement....3-37

P

Pressure Transmitter Replacement....3-38

R

Radiator Support Reinforcement Replacement – Upper and Lower....8-14
Rear Caliper Cover Replacement....8-27
Rear Drive Axle
Description
Rear Axle Vent Tube Filter....4-6
Repair
Rear Axle Vent Tube Filter Replacement....4-5
Rear Frame Bracket Replacement (Skid Plate)....8-25
Rear Mud Flap Replacement....8-28
Rear Skid Plate Replacement....8-22
Rear Support Beam Replacement (Skid Plate)....8-24
Rear Suspension
Description
Rear Enhanced Suspension....3-16
Rear Hydraulic Jounce Bumper....3-16
Rear Shock Absorber Cover Description....3-16
Rear Shock Absorber Description....3-16
Repair
Rear Jounce Shock Absorber Mount Replacement....3-14
Rear Jounce Shock Absorber Replacement....3-15
Shock Absorber Cover Replacement - Left....3-12
Shock Absorber Cover Replacement - Right....3-13
Shock Absorber Replacement....3-12
Rear Suspension
Fastener Tightening....3-11
Receiver Replacement....3-37
Reinforcement Brackets....8-17

S

Schematics
Tire Pressure Monitoring
Tire Pressure Monitoring System....3-31
Shock Absorber
Description
Rear Shock Absorber Description....3-16
Shock Absorber
Repair
Rear Jounce Shock Absorber Mount Replacement....3-14
Rear Jounce Shock Absorber Replacement....3-15
Shock Absorber Cover Replacement - Left....3-12
Shock Absorber Cover Replacement - Right....3-13
Shock Absorber Replacement
Front....3-4
Rear....3-12
Shock Absorber
Description
Front Shock Absorber Description....3-9
Shock Absorber Cover
Description
Rear Shock Absorber Cover Description....3-16
Spare Tire Carrier Replacement....3-26
Spare Tire Replacement....3-26
Special Tools and Equipment
Tire Pressure Monitoring....3-51
Tires and Wheels....3-29
Specifications
ECM Calibration
Engine Controls....6-5

Specifications
Fastener Tightening
Body Front End....8-13
Bumpers....8-7
Engine Controls....6-5
Engine Electrcial....6-3
Frame and Underbody....8-21
Front Suspension....3-3
Instrument Panel, Gages and Console....8-3
Rear Suspension....3-11
Tires and Wheels....3-17
General Specifications
Tire Pressure Monitoring....3-30
Tire Color Location
Tire Pressure Monitoring....3-30
Tire Pressure
Tire Pressure Monitoring....3-31
Tire Pressure Monitoring System Settings
Tire Pressure Monitoring....3-31

T

Tire Mounting and Dismounting Procedure....3-19
Tire Pressure Monitoring
Component
Function Display Unit....3-33
Relay Block - IP....3-34
Components
Connector End Views....3-35
Diagnosis
Error Code E1....3-36
Error Code E2....3-36
Error Code E3....3-36
Error Code E4....3-36
Repair
Monitor Display Replacement....3-37
Pressure Transmitter Replacement....3-38
Receiver Replacement....3-37
Tire Pressure Monitoring Programming....3-39
Tire Pressure Monitoring
Description General Description – Tire Pressure Monitoring....3-50
Special Tools and Equipment....3-51
Tire Pressure Monitoring
Schematics
Tire Pressure Monitoring System....3-31
Specifications
General Specifications....3-30
Tire Color Location....3-30
Tire Pressure....3-31
Tire Pressure Monitoring System Settings....3-31
Tires and Wheels
Component
Enhanced Mobility Wheel....3-18
Repair
Jack Mounting Bracket Replacement....3-27
Spare Tire Carrier Replacement....3-26
Repair
Spare Tire Replacement....3-26
Tire Mounting and Dismounting Procedure....3-19
Special Tools and Equipment....3-29
Tires and Wheels
Description
Beadlock Tire System....3-28
Fastener Tightening....3-17
Transfer Case
Description
Transfer Case Vent Tube Filter....4-8
Repair
Transfer Case Vent Tube Filter Replacement....4-7

U

Upper and Lower Fender Reinforcement Replacement....8-16

V

Vehicle Identification....0-3

BLANK